



Osicom



T-1 Drop and Insert CSU/DSU

INSTALLATION AND OPERATION MANUAL

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NOTICE

Osicom Technologies may incorporate enhancements in the product
and change the product specifications described in this manual
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NOTE: This equipment has been tested and found to comply with the limits for a Class A computing device pursuant to Part 15 of FCC Rules. These rules are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, might cause interference to radio communications.

Operation of this equipment in a residential area is likely to cause interference, in which case the user is required to correct the interference at his own expense.

This equipment also meets the technical criteria in the part 68 rules, Subparts A through F (for connection of terminal equipment to the telephone network).

FCC FACILITY INTERFACE CODES:

04DU9–BN: 1.544 Mbps SuperFrame format without line power

04DU9–DN: 1.544 Mbps SF and B8ZS without line power

04DU9–1KN: 1.544 Mbps ANSI ESF without line power

04DU9–1SN: 1.544 Mbps ANSI ESF and B8ZS without line power

04DU9–1ZN: 1.544 Mbps ANSI ESF and Zero Bit Time Slot Interchange

SERVICE CODE: 6.0N

JACK ARRANGEMENTS: RJ48C 8-pin modular telephone jack to connect to the network

V.32bis modem: Use an RJ11, 8-pin modular telephone jack to connect to DDD lines.

The wall-mounted transformer (included with the unit) must be used with the standalone (desktop) Routermate to assure reliability and compliance to the FCC and Underwriters' Laboratories requirements (as well as Canadian Department of Communications standards, when applicable).

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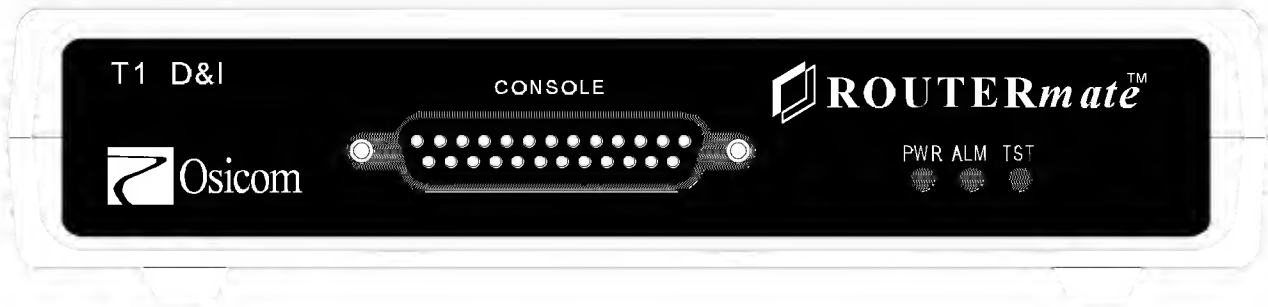


Figure 1-1. Routermate T-1 Drop and Insert

The Routermate™ T-1 Drop and Insert CSU/DSU provides the interface between customer equipment and a full or fractional T-1 facility. It also provides features that take full advantage of DACS (Digital Access Cross-connect Services) networks.

A Data Service Unit (DSU) is provided for the V.35 interface. The V.35 interface operates at multiples of 56 or 64 kbps up to 1.536 Mbps.

An NCTE interface is used to drop and insert other T-1 devices out the primary T-1 line.

Ordering information and part numbers for all versions of the Routermate are listed in Appendix B.

1.1 Functional Description

The primary function of a CSU/DSU is to provide isolation between the user's premise equipment and the carrier's T-1 transmission facilities. It also protects the customer equipment from hazardous line voltages or other potentially destructive signals (e.g., lightning) that could be carried into the facility.

In addition to isolation and protection, the Routermate:

- Regenerates incoming signals weakened or distorted by the transmission facility
- Diagnoses/isolates faults
- Isolates and prevents the customer equipment or facility from degrading the performance of the carrier network.

The Routermate provides alarms and error statistics, including Red, Blue, and Yellow alarms.

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1.2 System Features

Management

The Routermate can be managed in a variety of ways.

Management Screens - password-protected management screens can be accessed from a PC or serial terminal, or by a Telnet connection.

SNMP - an embedded Simple Network Management Protocol (SNMP) agent resides in the T-1 CSU/DSU. An enterprise Management Information Base (MIB) provides full configuration and diagnostic control. SNMP is via a SLIP link, commonly supported by routers, terminal servers, and workstations.

Telnet - a Telnet connection can be made to the Routermate's SLIP interface to access the management screens.

One Telnet connection is allowed at a time; however, Telnet, SNMP and dial-in management can be performed at the same time.

Dial-in Management - an optional, integral V.32 modem lets the management screens be accessed from a remote modem over DDD lines, regardless of the state of the primary link.

A router or other device connected to the Routermate's **CONSOLE** interface can also be accessed from a remote modem. In addition to providing access to the CSU's console interface, the dial-in manager can access up to two other ASCII devices attached to the Routermate.

Hot keys can be used to switch between the Routermate, and the other connected devices.

Alarm Call Option - allows the user to enable and to limit the use of the modem to send alarm notifications to an ASCII device attached to a remote modem. When enabled, the integral modem will attempt to dial out if the CSU detects a change in the NI or NCTE Red, Blue, or Yellow alarm conditions.

Drop and Insert

A standard NCTE interface lets the Routermate T-1 D&I CSU/DSU function as a drop and insert T-1 multiplexer. DS0's are assigned to the V.35 or NCTE interface. Up to 24 DS0s can be assigned for both interfaces combined.

Encryption

The user can ensure the security of frame relay data by connecting an optional FPX4802/DES Frame Relay Encryptor.

ESF Operation

The Routermate features Extended SuperFrame (ESF) operation. ESF provides a 4 kbps data link channel transparent to user data. With ESF, the Telco central office can continuously monitor the local loop, transmit and receive test messages and retrieve performance statistics. The Routermate is fully compliant with both ANSI T1.403 and AT&T 54016 ESF messaging specifications.

Protection for the Network

The Routermate provides complete protection for the network. When ANSI 62411 coding is selected, it automatically inserts pulses into the transmitted signal as required to meet bit density specifications as defined in AT&T's Technical Publication 62411. For applications that do not meet bit density requirements, inverted data can be selected.

Diagnostics

The Routermate continuously monitors the performance of the T-1 link. Errors are reported in separate user and carrier registers. The carrier registers are under control of the Telco central office. The user registers cannot be reset by the central office and may be used to provide an audit of T-1 link performance.

Built-in Bit Error Rate Tester

The Routermate includes a built-in bit error rate tester (BERT), eliminating the need for external test equipment. The built-in tester can transmit any one of three test patterns: Framed QRSS, Framed Ones or Minimum Density. Bit errors can be inserted in all patterns. The Routermate records seconds in test, seconds in error, and last reset time.

Data Rate

The V.35 interface can be set for any of 24 speeds in multiples of 56 kbps, or 24 speeds in multiples of 64 kbps (up to 1.536 Mbps).

Clear Channel Operation

The Routermate uses B8ZS (Bipolar Eight Zero Substitution) for clear channel operation. Clear channel operation may be required in applications where the user data is formatted in contiguous $N \times 64k$ multiples and where the protocol does not guarantee minimum ones density (where less than 12.5% of transmitted data contains a binary one state).

1.3 Application

Figure 1-2 illustrates drop and insert access in which voice and data are brought together into a single T-1 transmission. Nx56k/64k speeds are supported on the V.35 interface for router data. User-defined DS0s carry the voice traffic from the PBX. Users can take advantage of carrier-provided services that consolidate voice and data traffic, thus reducing recurring line costs. Multiple management facilities include local terminal management, TELNET access from anywhere on the network, and local or remote SNMP management.

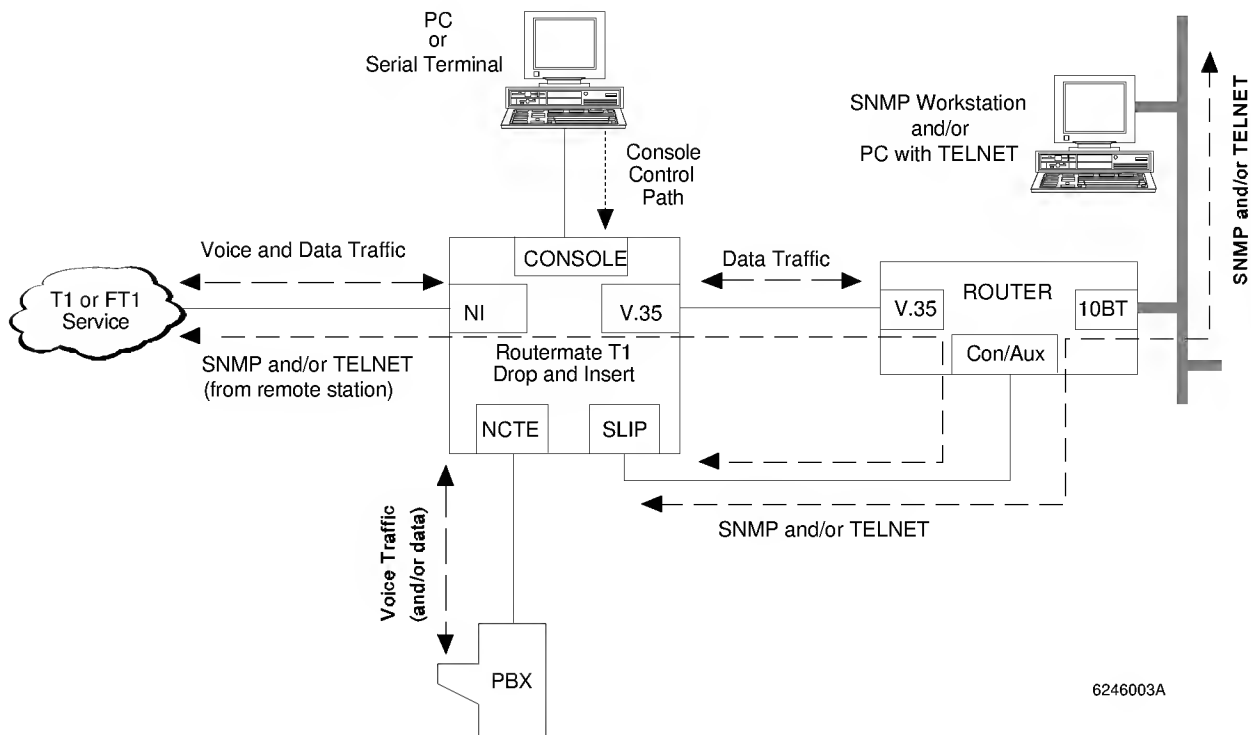
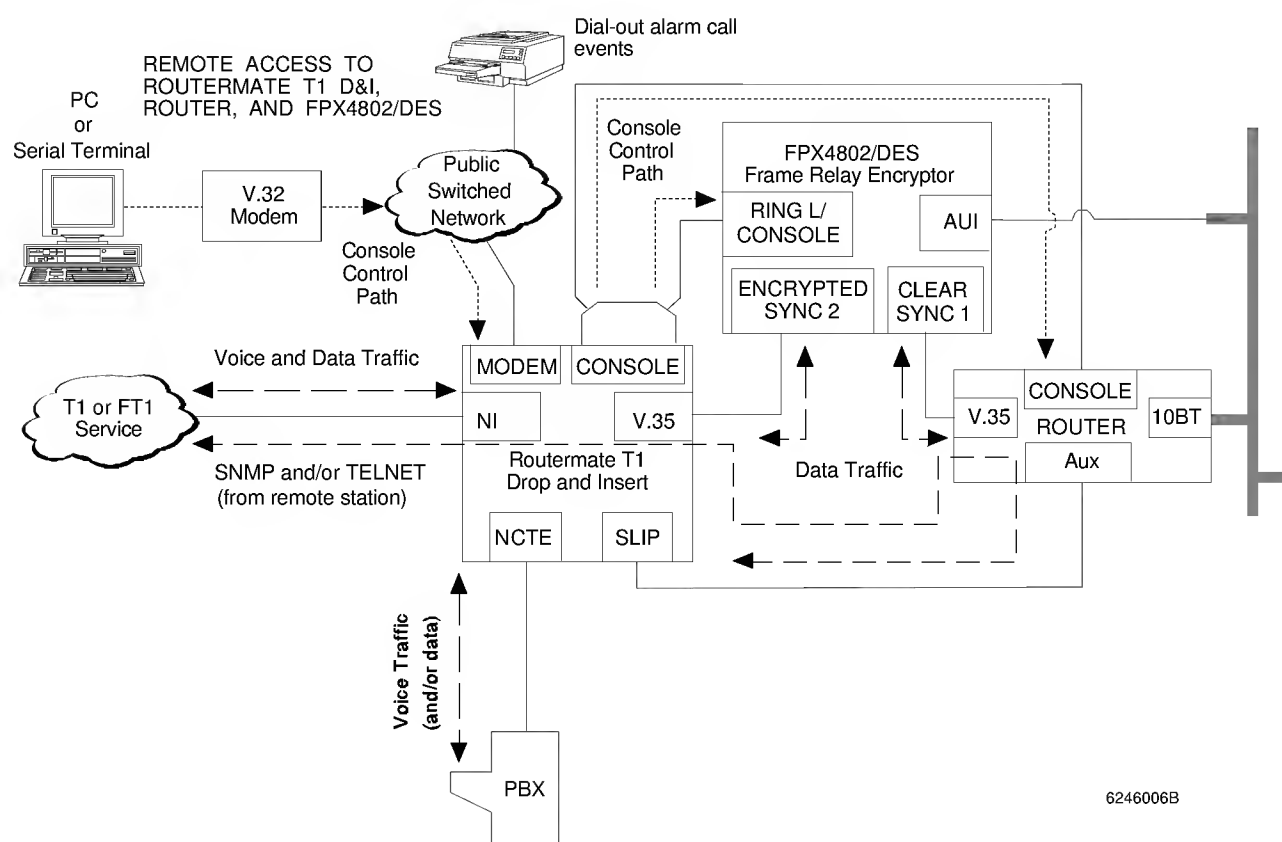


Figure 1-2. Basic Application

Figure 1-3 illustrates the same application with encrypted frame relay and local management. Management data normally reaches the router and encryptor over Ethernet, and reaches the Routermate through its SLIP interface. In the event of network failure, an integral V.32 modem lets the dial-in user manage multiple devices via a single call. This application is especially useful for service providers who maintain customer premise equipment.



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Figure 1-3. Advanced Application

In Figure 1-4, two Routermates are connected in tandem. This application can be used to provide additional V.35 interfaces that pass data on the same T-1 line. The additional interfaces can be at the same site, or at different sites so long as the application adheres to the distance constraints for DS1 and DSX interfaces.

As seen in Figure 1-5, when a Routermate is connected in tandem with either another Routermate or a multiplexer with a DSX interface, the additional Routermate or multiplexer provides additional interfaces, and the Routermate that connects to the central office provides the CSU.

1.4 Using this Manual

Refer to the following chapters for the indicated information:

- Chapter 2, *Installation* - hardware installation and Quick Start procedure.
- Chapter 3, *Terminal Operation* - how to access and move around in the management screens.
- Chapter 4, *Maintenance and Repair* - service telephone numbers and instructions for returning faulty equipment.
- Appendix A, *Interfaces and Cables* - interface and cable pin-outs.
- Appendix B, *Ordering Information* - order numbers for the Routermate and cables available from Osicom.
- Appendix C, *Specifications* - product specification.
- Appendix D, *Multipurpose Label* - for convenience, duplicates the multipurpose label located on the underside of the unit.

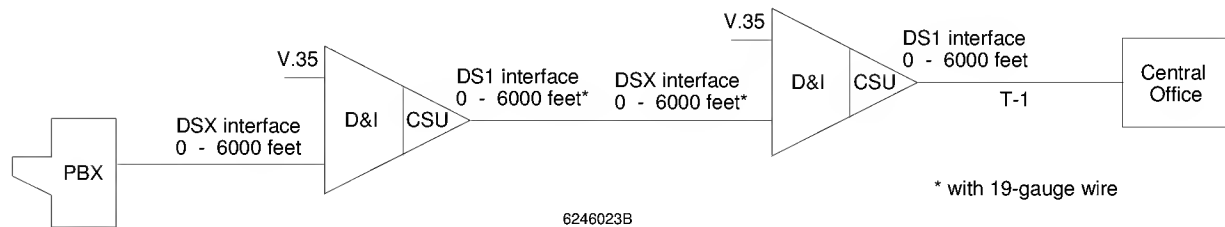


Figure 1-4. Two T-1 Drop and Insert CSUs in Tandem

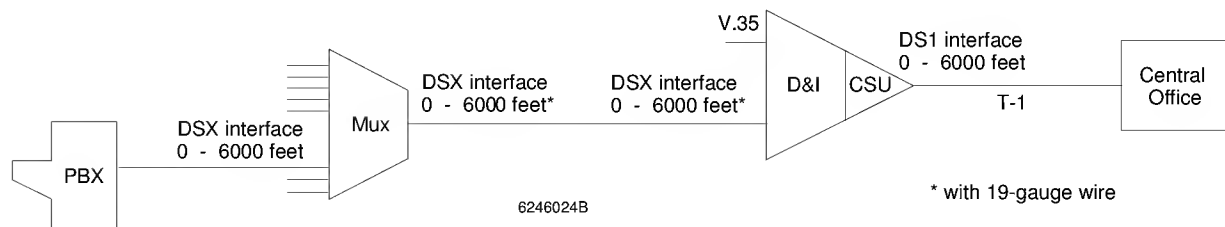


Figure 1-5. T-1 Drop and Insert CSU Providing CSU for Data Mux

This chapter describes:

- installation procedures
- interfaces
- cable applications
- LEDs
- management connections (terminal, SNMP, Telnet, Dial-In)
- obtaining SNMP enterprise MIB

See Chapter 3 for management screens and configuration details.

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2.1 Unpacking

All equipment is normally shipped in cardboard cartons with foam inserts to protect the units from shock and vibration experienced during shipment. Upon arrival of the equipment, inspect the condition of the received cartons and compare all items to the packing list attached to the carton.

The following items are included with the unit:

- NI cable (DCA94511)
- NCTE cable (115-0611-01)
- DDD cable (modem models)
- Wall-mount transformer (standalone models)
- Manual (918-6246)

Console, SLIP, and V.35 cables also are available. See [Installation Checklist](#) on [page 2-2](#).

Notify both Osicom Technologies' Customer Service Department (1-800-359-2273) and the transportation carrier *immediately* if there are any damages or shortages.

Save the cartons and foam inserts in case the unit must be shipped at a later date.

2.2 Installation Checklist

1. Prepare the site, including provision of a grounded power outlet.
2. Verify that common carrier or customer-supplied line is installed.
3. Obtain the terminal and SLIP cables from your terminal vendor and router (or terminal server) supplier.

- The terminal cable should be a terminal-to-async modem (DCE) cable type.
- For SLIP management (SNMP or Telnet), cabling depends on the interface of the connected device. See [Section 2.6, page 2-8](#) for cabling information for SLIP management.

Interface and cable pin connections are in Appendix A. Cable ordering information is in Appendix B.

4. Connect an ASCII terminal to the **CONSOLE** interface. See [Terminal Management, Section 2.5, page 2-7](#).
5. Use the management screens to configure the NI, SLIP, NCTE, Modem, and V.35 interfaces.
See the following sections in Chapter 3:
 - NI and NCTE interface configuration: see [System Configuration, Section 3.7, page 3-9](#).
 - SLIP interface configuration: see [Management, Section 3.15, page 3-35](#).
 - Modem interface configuration: see [Dial-In Management Options, Section 3.14.3, page 3-31](#).
 - V.35 interface configuration: see [V.35 Configuration, Section 3.8, page 3-13](#).
6. For models with the integral V.32 modem, DDD cable 115-0414-001 comes with the unit. Connect the modem and any auxiliary devices as described in [Section 2.7, Dial-In Management, page 2-10](#).

2.2.1 Communications Line Requirements for CSU/DSU

The communications facility between Routermates should be a full or fractional T-1 line. When the Routermate is used as an LDM (Limited Distance Modem), the communications facility should be a metallic baseband line with a wire gauge between 19 and 26 (inclusive).

The baseband line must have the following characteristics:

- Metallic continuity
- Non-switched
- Two shielded twisted pairs
- Must not be equipped with correcting circuits, repeaters, or loading coils

We recommend that you use two separate twisted-pair cables. In noisy environments, use shielded twin cables that are grounded to your telecommunications facility.

2.2.2 FCC Part 68 Requirements for CSU/DSU

Notification to the Telephone Company

The Routermate T-1 D&I CSU/DSU complies with Part 68 of FCC Rules. Provide the 14-character FCC Registration Number (see [multipurpose label](#) on underside of unit), plus the [Facility Interface Codes](#) (according to data transmission speed) and [Service Order Code](#) (see front matter of manual) to your telephone company so they can connect the necessary service.

Malfunction of the Equipment

In the event this equipment should fail to operate properly, disconnect the unit from the communications line until you learn whether the source of trouble is in your equipment or in the line. If the trouble appears to be with this unit, discontinue use of the unit until it is repaired.

Under FCC rules, no customer is authorized to repair this equipment. This restriction applies whether the equipment is in or out of warranty.

Please note that the telephone company may ask that you disconnect this equipment from their lines until the problem has been corrected or until you are sure that the equipment is not malfunctioning.

Incidence of Harm

If your equipment causes harm to the network, the telephone company may discontinue your service temporarily. If possible, they will notify you in advance. But if advance notice is not practical, you will be notified as soon as possible.

Rights of the Telephone Company

Your telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the proper functioning of your equipment. If they do, you will be notified in advance to give you an opportunity to maintain uninterrupted service.

Industry Canada's Compliance Notice

This Class A digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel du Canada.

2.2.3 FCC Part 68 Requirements for V.32 Modem

The following requirements apply if the optional V.32 modem is installed.

Notification to The Telephone Company

The modem complies with Part 68 of FCC Rules. The label located on the bottom of this unit contains the FCC Registration Number and Ringer Equivalence Number for this equipment. You must, upon request, provide this information to your telephone company. The Ringer Equivalence Number (REN) is used to determine the quantity of devices you may connect to your telephone line and still have all of those devices ring when your telephone number is called. To be certain of the number of devices you may connect to your line, as determined by the REN, you should contact your local telephone company to determine the maximum REN for your calling area.

Jack Type Needed

The Routermate T1 D&I uses an 8-pin modular jack to connect the modem to the dial network.

Incidence of Harm

If your telephone equipment causes harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, they will notify you in advance. But if advance notice is not practical, you will be notified as soon as possible. You will be informed of your right to file a complaint with the FCC.

Rights of The Telephone Company

Your telephone company may make changes in its facilities, equipment, operations or procedures that could affect the proper functioning of your equipment. If they do, you will be notified in advance to give you an opportunity to maintain uninterrupted telephone service.

Malfunction of The Equipment

In the event this equipment should fail to operate properly, disconnect the unit from the telephone line. Try using another FCC-approved telephone in the same telephone jack. If the trouble persists, call your telephone company repair service. If the trouble does not persist and appears to be with this unit, disconnect the unit from the telephone line and discontinue use of the unit until it is repaired. Contact Osicom Technologies for equipment repair at 301-317-7400.

Please note that the telephone company may ask that you disconnect this equipment from their lines until the problem has been corrected or until you are sure that the equipment is not malfunctioning.

Coin Service or Party Line

This equipment may not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs.

2.3 LEDs

Front panel LEDs continuously indicate unit status:

- PWR** green; lights steady-on when power is on.
- ALM** red; lights steady-on when an alarm condition has occurred.
- TST** red; flashes when a V.35 interface test is in progress; lights steady-on when a system test is in progress. .

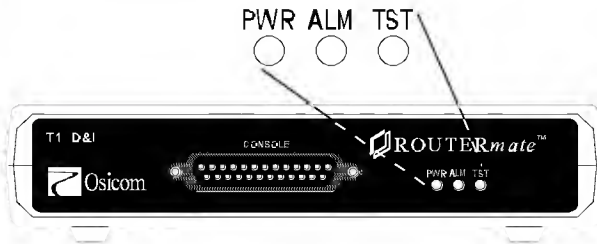


Figure 2-1. LEDs

2.4 Interfaces

Figure 2-2 shows the rear panel connectors. Figure 2-3 gives a cabling overview.

Appendix A provides interface pin descriptions and cable illustrations. Appendix B lists order numbers for cables.

Power Connector, Standalone Unit

The standalone Routermate includes a wall-mount transformer (Figure 2-4). See Appendix C, *Specifications*, for [power requirements](#).

To avoid possible errors due to potential difference between grounds for the CSU/DSU and for the Data Terminal Equipment (DTE) the power receptacle for the Routermate and DTE should be served from the same AC distribution panel or dedicated outlet.

NOTE

Use only the wall-mount transformer included with the unit. See the [multipurpose label](#) on the underside of the unit for the part number.

Network Interface

The interface labeled **NI** (Network Interface) is an 8-pin modular jack. It connects the Routermate to the carrier facility. It accommodates D4- or ESF-framed formats or fractional T-1 input using from 1 to 24 DS0s (64 kbps time slots).

Use shielded cable DCA94511, included with the unit, to connect the **NI** jack to the RJ48C Telco jack.

Configure the network interface to match the type of service supplied by the carrier (see [System Configuration](#), [Section 3.7](#), [page 3-9](#)).

SLIP Interface

The **SLIP** interface is an 8-pin keyed modular jack. It provides a Serial Line Internet Protocol (SLIP) connection for SNMP management. It typically is used to connect to a router. A Telnet connection to the Routermate management screens also can be made via the SLIP interface. For installation and cabling see [SLIP Management](#), [Section 2.6](#), [page 2-8](#).

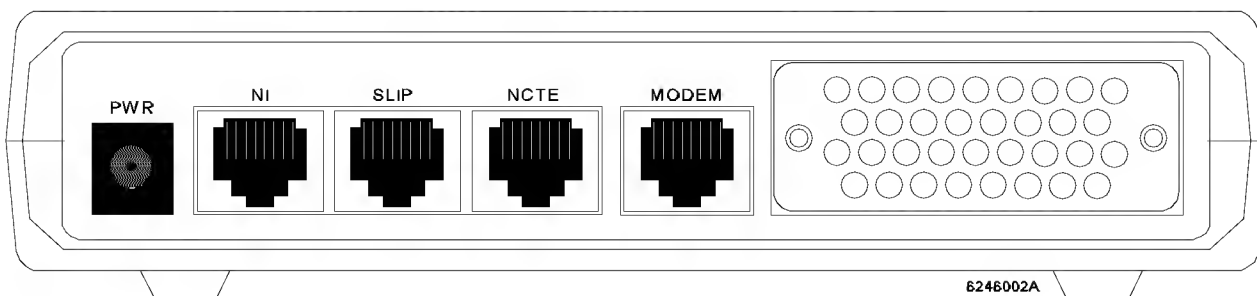


Figure 2-2. Rear Panel Connectors

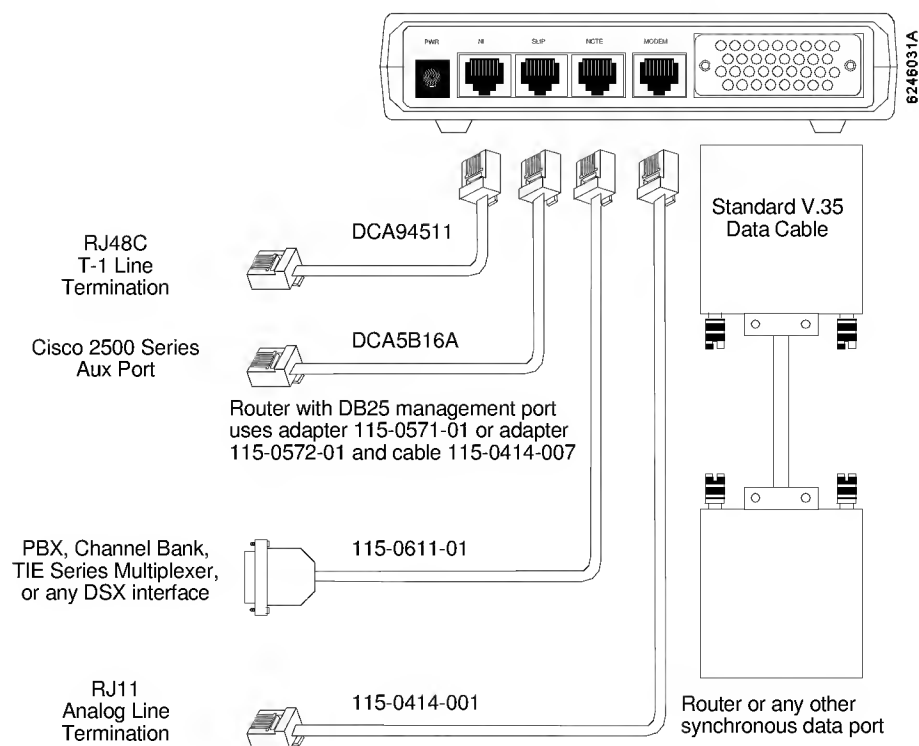


Figure 2-3. Rear Panel Cable Connections

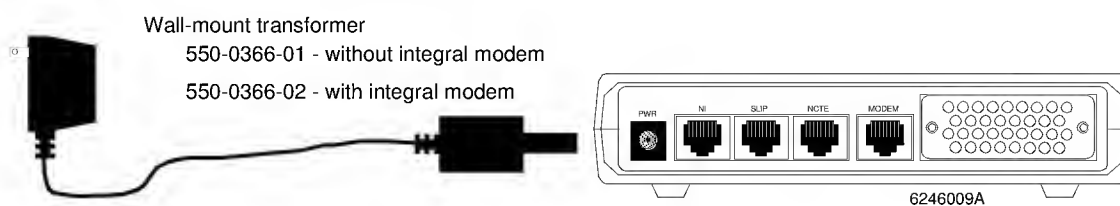


Figure 2-4. Power Connection with Wall-mount Transformer

NCTE Interface

The NCTE interface is an 8-pin modular jack. It connects the Routermate to the customer's PBX or other DS1 device. Use the 6 inch, 8-pin modular to DB15 cable adapter 115-0611-01 (included). See [System Configuration \(Section 3.7, page 3-9\)](#) to configure NCTE interface parameters.

Modem Interface

The **MODEM** interface is an 8-pin modular jack. When the optional integral V.32 modem is present, this interface provides a connection to dial lines for secure remote dial-in access of the Routermate's management screens. Use cable 115-0414-001.

NOTE

Cable 115-0414-001 is a 6-pin cable that connects the 8-pin **MODEM** interface to a 6-pin RJ11 wall jack. Cable pins 3 and 4 align with **MODEM** interface pins 4 and 5, respectively.

The following devices, when connected to the **CONSOLE** interface, can also be remotely managed via the modem interface:

- router, terminal server or other compatible device.
- Optional FPX4802/DES Frame Relay Encryptor connected in-line to the router or other device.

V.35 Interface

A 34-pin V.35 female connector. See [V.35 Configuration \(Section 3.8, page 3-13\)](#) to configure V.35 interface parameters. This interface is connected to the DTE, which typically is a router.

CONSOLE Interface

The **CONSOLE** interface is a DB25 female connector that can be used for the following management methods:

- Terminal access of the Routermate management screens. See [Section 2.5, page 2-7, Terminal Management](#).
- Dial-in management of a router or other compatible device connected to the Routermate. See [Section 2.7.2, page 2-12, Connecting to the AUX 0, Aux 1 Device](#).
- Dial-in management of an optional FPX4802/DES Frame Relay Encryptor connected in-line between the Routermate and a router or other compatible device. See [Section 2.7.2, page 2-12, Connecting to the AUX 0, Aux 1 Device](#).

2.5 Terminal Management

To access the Routermate's management screens:

1. Connect a PC or serial terminal to the **CONSOLE** interface on the Routermate front panel. The console cable should be a straight-through cable with a DB25-male connector at the Routermate (DCE) end and a connector that matches the terminal interface at the terminal (DTE) end.
2. Turn on the terminal and set the terminal transmission options:
 - Rate: 9600 bps
 - Mode: full duplex
 - Character: 8 bits
 - Parity: none
 - Stop bits: 1
 - Flow control: DC1/DC3 (Xon/Xoff)

The Routermate's **CONSOLE** interface is fixed at 9600 bps, 8 character bits, 1 stop bit, and no parity.

The Routermate's Terminal Selection screen is displayed.

If no screen is displayed, type **[CTRL-N]**.

3. From the list presented, select a terminal type that matches the terminal being used.

A password prompt is displayed.

4. For initial installation, no password has been set; press **[CR]**.

The Main Menu is displayed.

See [Chapter 3, Terminal Operation](#) for a description of the management screens.

If selecting a terminal type results in a faulty display, type **[CTRL-N]** to re-display the Terminal Selection screen, and make a different selection.

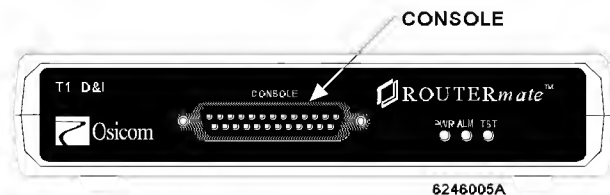


Figure 2-5. Console Interface

2.6 SLIP Management

The Routermate's SLIP (Serial Line Internet Protocol) interface enables SNMP management and simultaneous traffic from a single Telnet connection.

2.6.1 SNMP/Telnet Installation

To use SNMP or Telnet to manage the Routermate:

1. Connect SLIP cabling.

The Routermate's SLIP interface is compatible with Cisco 2500 Series and compatible routers. Use a straight-through 8-pin to 8-pin modular cable (Osicom cable number DCA5B16A) to connect from the Routermate's **SLIP** interface to the SLIP interface of the router, terminal server, or other device that implements SLIP (Figure 2-6).

To connect to a router that provides a DB25 SLIP interface, use the cables and adapters shown in Figures 2-7 and 2-8.

2. Ensure that the SLIP port on the connected device is configured to match the configuration of the Routermate's SLIP interface, which is fixed at:
 - 9600 bps asynchronous
 - 8 data bits plus 1 stop bit
 - no parity
3. Using a terminal connected to the **CONSOLE** interface (see [Section 2.5, page 2-7](#)), configure SNMP and Telnet management parameters on the Management screen (see [Section 3.15, page 3-35](#)).
 - For both Telnet and SNMP applications, assign an IP address to the Routermate by configuring the **Internet Address** and **Subnet Mask** parameters.
 - Before attempting a Telnet connection, set the **Access via telnet** parameter to *Enabled*.
 - Before SNMP management can be used, configure the **SNMP R/O Community**, and **SNMP R/W Community** strings to match the community strings used by the SNMP management station.

2.6.2 Obtaining the Enterprise MIB

For SNMP management, the enterprise MIB can be downloaded from Osicom's Web site at

<http://www.osicom.com>

2.6.3 Telnet Operation

The SLIP feature also provides access to the Routermate's terminal management screens via a Telnet connection.

The Routermate allows one Telnet connection at a time; however, Telnet, SNMP, and dial-in management can be simultaneous.

A Telnet connection can be made from any device that uses the Telnet protocol and accesses the Routermate via the SLIP interface.

A Telnet connection also can be made by connecting the SLIP interface to an IP station.

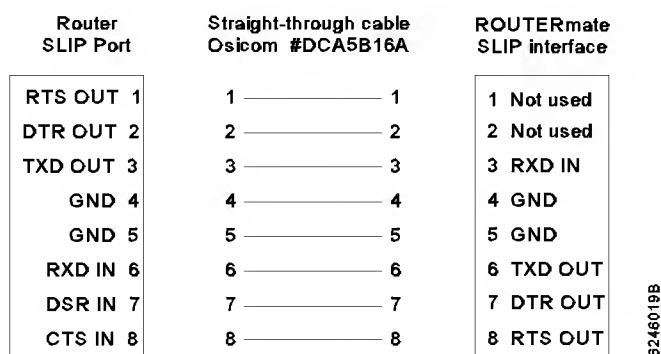


Figure 2-6. SLIP Connection to Cisco 2500 and Compatible Routers

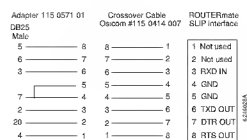


Figure 2-7. SLIP Connection to Routers with DB25-Female SLIP Interface

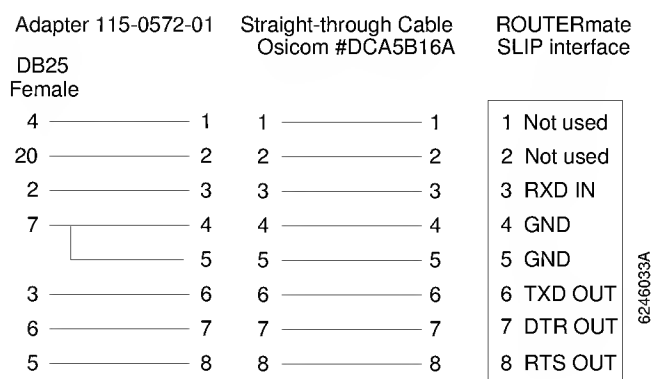


Figure 2-8. SLIP Connection to Routers with DB25-Male SLIP Interface

2.7 Dial-In Management

The optional integral V.32 modem provides secure dial-in management of the following:

- Routermate management screens.
- An external device (usually a router) connected to the Routermate's **CONSOLE** interface.
- Management screens for an optional FPX4802/DES Frame Relay Encryptor connected in-line with the external device.

The Routermate's integral V.32 modem is answer-only. Dial-in management calls can be made from a remote modem when the primary link is up or down.

Hot keys can be used to switch between the managed devices (see [Section 3.5.1, page 3-7](#)).

A modem security code can be exchanged during the handshake sequence between the integral modem and the remote modem; if this feature is to be used, the remote modem must be an Osicom DCM4232 or DCM4532.

Figure 2-9 shows dial-in management cable connections,

Installation for the various dial-in management applications is described in the following sections.

2.7.1 Connecting to the Routermate Management Screens

Before making a dial-in management call to the Routermate management screens:

1. Connect straight-through cable 115-0414-001 or equivalent from the **MODEM** interface to the DDD service RJ11 jack.

NOTE

Cable 115-0414-001 is a 6-pin cable that connects the 8-pin **MODEM** interface to a 6-pin RJ11 wall jack. Cable pins 3 and 4 align with **MODEM** interface pins 4 and 5, respectively.

2. Ensure that the following parameters are set as required (the default settings can be used):

At the Unit screen (see [Section 3.14, page 3-28](#)),

Console/CSU Password (default: *[CR]*)

At the Dial-In Management Options screen (see [Section 3.14.3, page 3-31](#)),

Auto Answer (default: *Enabled*)

Modem Security (default: *Disabled*)

Dial-In Password (default: *[CR]*)

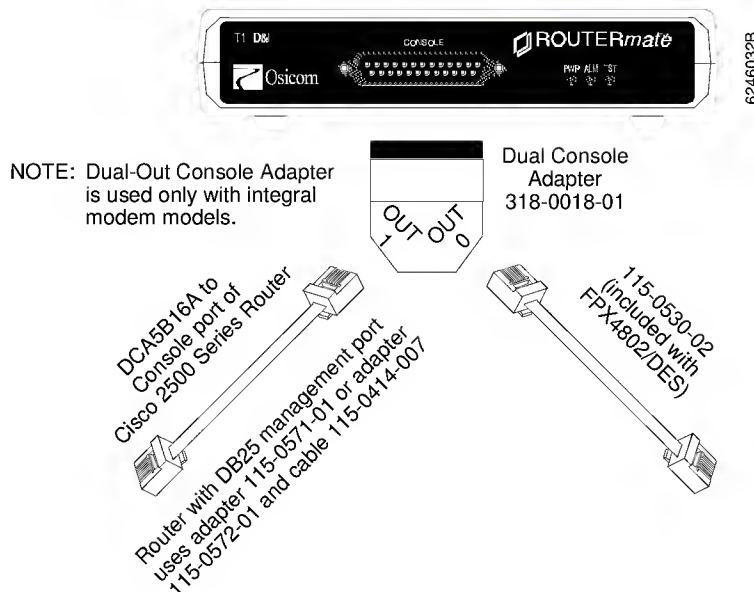


Figure 2-9. Dial-In Management Cable Connections

3. Skip to Step 4 unless a modem security code is to be exchanged between the integral modem and a remote DCM4232 or DCM4532 modem during the modem handshake.

If the security code is to be used:

- a. At the Dial-In Management Options screen (see [Step 2](#)), configure the integral modem as follows:
 - i. Set **Modem Security** to *Enabled*.
 - ii. If desired, re-configure **Modem Security Code**.

This code must be the same for the integral modem and the remote DCM4232 or DCM4532 modem. The default code is the string *password* in both the integral modem and the DCM4232 or DCM4532.

- b. Configure the remote DCM4232 or DCM4532 used to originate the call:
 - i. The DCM4232 and DCM4532 have both an active and a pending password. Set both passwords to match the integral modem's **Modem Security Code** (default is *password*).

Enter: AT"Zpassword
AT"Ypassword

- ii. Set the DCM4232 or DCM4532 modem user ID to *usr* in order to connect to the Routermate with security.

Enter: AT"Wusr.

4. Place a call from the remote modem to the Routermate.

NOTE

If no Dial-In password has been configured, terminal selection and the Dial-in password prompt are bypassed; connection must be from a VT100 or VT100-emulating terminal.

NOTE

If the remote modem is a DCM4232 or DCM4532, enter:

ATDT#####

After the handshake the following prompt appears:

CONNECTED 9600

After the modem handshake, the Routermate's Device Selection Menu displays:

0 - Aux Port 0: Device 0
1 - Aux Port 1: Device 1
2 - T1 CSU/DSU
L - Logoff

If a Dial-in password has been configured, and the **Terminal Type Select** option is set to *Enabled*, you are prompted to select a terminal type and then to enter the configured password before the Device Selection Menu is displayed (see [Unit Configuration, Section 3.14, page 3-28](#)).

5. Select **2 - T1 CSU/DSU**. You are prompted to enter a password.
6. If no Console/CSU Password has been configured, press **[CR]** at the password prompt.

If a password has been configured, enter the **Console/CSU Password** (see [Unit Configuration, Section 3.14, page 3-28](#)).

After the password is successfully entered, the Routermate's Main Menu is displayed.

A dial-in management call locks out a local terminal connected to the Routermate's **CONSOLE** interface. The local terminal displays the message:

Local Terminal Locked

Management Call

In Progress

Please wait until call disconnects.....

Select **Logoff** at the Device Selection Menu to disconnect the management call.

2.7.2 Connecting the AUX 0, Aux 1 Device

The asynchronous management port of a router or other compatible device can be connected to the Routermate's **CONSOLE** interface. The connected device can then be managed from a remote terminal that dials in over the **MODEM** interface.

To connect to the device:

1. Connect cabling from the Routermate's **CONSOLE** interface to the device's management port.

The cabling used depends on the interface provided by the connected device.

Figure 2-10 shows the cable and adapter required to connect the Routermate **CONSOLE** interface to a Cisco 2500 Series router or compatible device.

Figures 2-11 and 2-12 show the cabling and adapters for connecting to a device whose management interface provides a DB25 connector.

Note in the figures that **OUT 0** on the adapter connects pin 11 of the Routermate **CONSOLE** interface to pin 7 (ground). When the adapter is installed, this signals to the unit that an auxiliary device is connected instead of a terminal.

2. Ensure that the management port on the connected device is configured to match the configuration of the Routermate's **CONSOLE** interface, which is fixed at:
 - 9600 bps asynchronous
 - 8 data bits plus 1 stop bit
 - no parity

3. If an FPX4802/DES Frame Relay Encryptor is being connected in-line between the Routermate T1 D&I and the managed Device 0, connect cable 115-0530-xx (Figure 2-13) from the adapter connector labeled **OUT 1** to the FPX4802/DES's **RING L/CONSOLE** interface (this is the terminal cable shipped with the FPX4802/DES). Configure the FPX4802/DES as described in the FPX4802/DES manual.

Connect a standard V.35 cable from the Routermate T1 D&I **V.35** interface to the FPX4802/DES **ENCRYPTED SYNC 2** interface. Connect a second standard V.35 cable from the FPX4802/DES **CLEAR SYNC 1** interface to the router's V.35 interface.

4. Place a call to the integral modem, as described in [Step 4, Section 2.7.1, *Connecting to the Routermate Management Screens* \(page 2-10\)](#).
5. Select, as appropriate, one of the following at the Routermate's Device Selection Menu:

0 - AUX Port 0: Device 0 - router or other device connected to the adapter connection labeled **OUT 0**.

1 - AUX Port 1: Device 1 - FPX4802/DES connected to the console adapter connection labeled **OUT 1**.

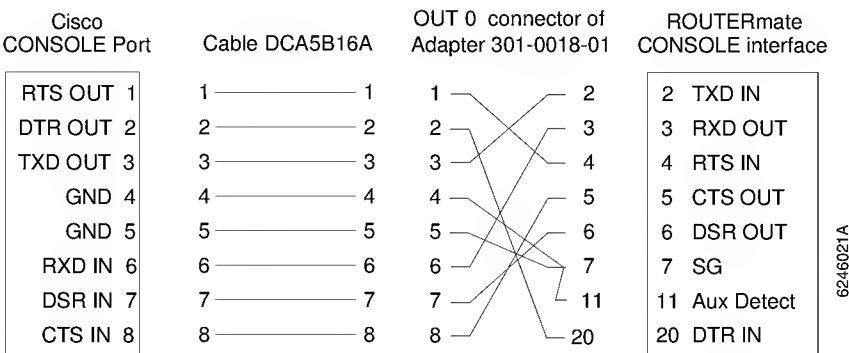


Figure 2-10. Dial-In Management Connection to Cisco 2500 and Compatible Routers

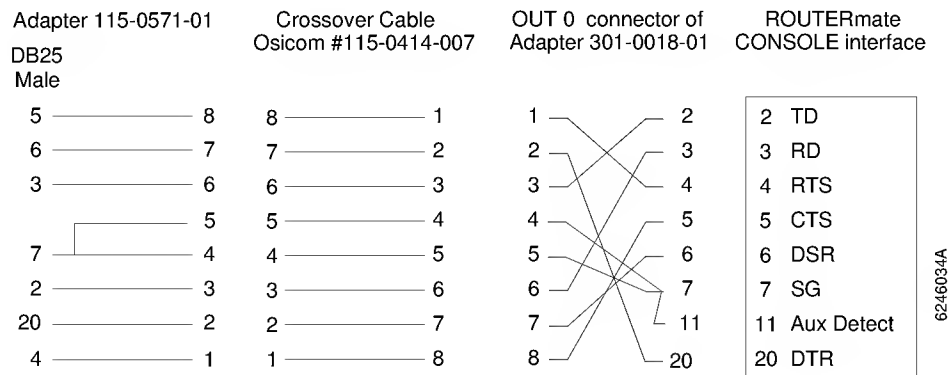


Figure 2-11. Dial-In Management Connection to Routers With DB25-Female Management Port

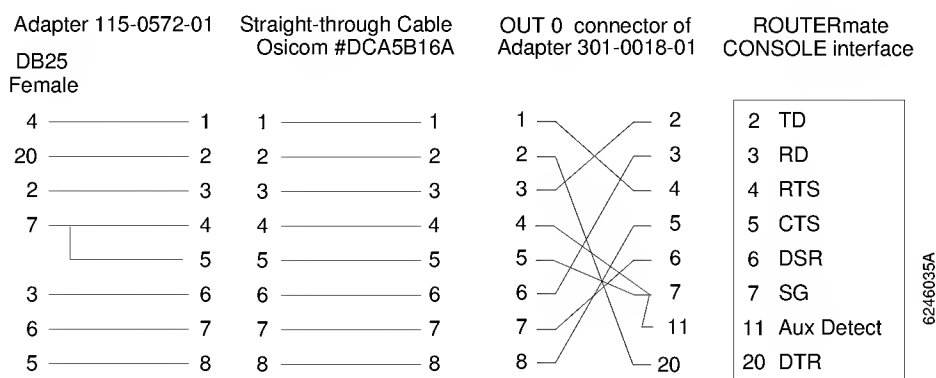


Figure 2-12. Dial-In Management Connection to Routers With DB25-Male Management Port

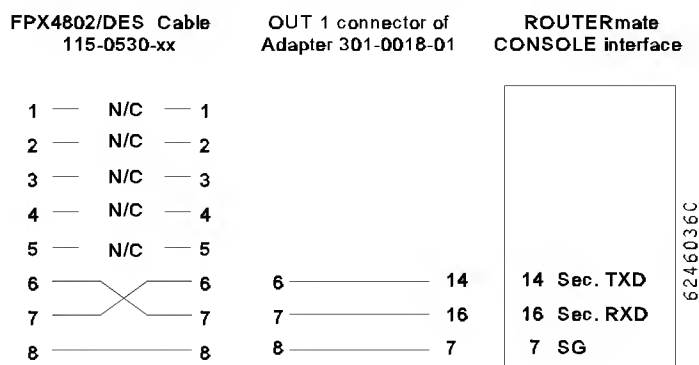


Figure 2-13. Cable Connections to FPX4802/DES Frame Relay Encryptor

This chapter explains how to use the management screens to configure and manage the Routermate T1 D&I.

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3.1 Screen Structure

Figure 3-1 illustrates the screen structure for the terminal management screens.

Brief descriptions of the screens are provided below.

Terminal Selection - identify type of terminal being used to access the management screens.

Device Selection - access either the Routermate management screens or a device connected to the **CONSOLE** interface.

Main Menu - select subsequent screens.

System Configuration - configure the network and NCTE interfaces.

V.35 Configuration - configure the V.35 interface.

Bandwidth Allocation - assign DS0s to the V.35 and NCTE interfaces.

System Diagnostics and Statistics - control diagnostics and monitor statistics for the network and NCTE interfaces; at second page, display summary of ESF user and carrier registers.

V.35 Diagnostics - control diagnostics, monitor statistics for the V.35 interface.

User Registers - display status of the ESF link over a 24-hour period in 15 minute intervals. Use this screen to pinpoint exactly when errors occurred. You can reset these registers at any time.

Carrier Registers - display status of the ESF link over a 24-hour period in 15 minute intervals. This is the information the Telephone Company would see if requested.

Unit - create or change screen header text, set the unit's inactivity timeout, and configure the console password. Access the System Restart and Service Information screens. Access the Dial-In and Alarm Call option screens (if a modem is installed).

Management - configure unit for SNMP and Telnet management.

Logoff - terminal management: deactivates terminal screens and causes the Terminal Selection screen to be displayed. Remote modem management: deactivates terminal screens and causes the Device Selection Menu to be displayed. Telnet: disconnects Telnet session.

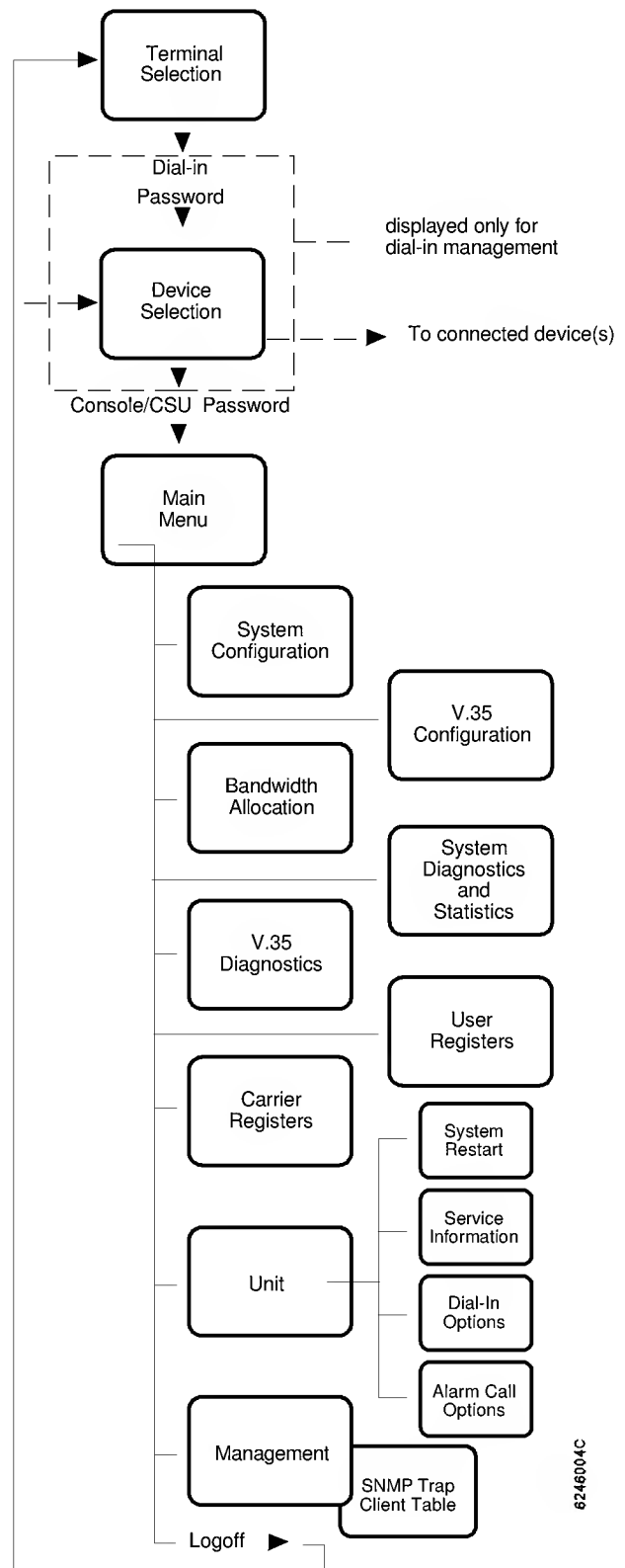


Figure 3-1. Screen Structure

3.2 Keys and Conventions

Prompts at the bottom of each screen instruct the user which keys to use to:

- Position the cursor
- Edit parameters
- Execute commands
- Access other screens

Table 3-1 summarizes the most frequently used keys.

Edit Fields

To configure a parameter by typing a value:

- Press **[CR]** to highlight the field.
- Type the value.
- Press **[CR]** again to exit the field.

To restore the parameter to its original contents, press **[Esc]** before exiting the field.

To edit existing text in a field that can be edited:

- Move the cursor to the field and press **[Ctrl-E]** to highlight the field.
- Use the arrow keys to move the cursor within the field.
- Type over the existing information.
- Press **[CR]** to exit the field.

To delete existing text from a field that can be edited:

- Move the cursor to the field and press **[CR]**.
- Press **[Space Bar]**.
- Press **[CR]** again.

Selecting from multiple options

- Move the cursor to the parameter.
- Press **[CR]** to toggle/scroll through the available options.
- When the desired option is displayed, either move the cursor to the next parameter using **[Space Bar]** or **[Backspace]**, or exit the screen.

To restore the parameter to its original contents, press **[Esc]** before exiting the field.

Saving Changes

Press **[X]** to exit from a screen. If you have modified any parameter, you are prompted:

Confirm this configuration?
No Yes

Select *No* to exit the current screen without saving the changes; select *Yes* to save the changes and exit.

Table 3-1. Frequently Used Keys	
KEY	FUNCTION
Move Around in Screens	
[Space Bar]	cursor down
[Back Space]	cursor up
[Ctrl-N]	Terminal Selection screen
[Ctrl-O]	re-draw screen
[Ctrl-T]	return to Main Menu *
[X]	exit to previous screen
Type an Entry	
[CR]	select field
[Back Space]	delete character left
[Esc]	restore original setting
[Ctrl-E]	highlight field, edit text
[CR][Space Bar][CR]	delete current contents
Select From List	
[CR]	scroll/toggle through list
[Esc]	restore edited field to its original setting
[Space Bar]	move to next field
* [Ctrl-T] returns to the Main Menu <u>without</u> prompting to confirm configuration changes.	

Certain prompts will change to correspond to the function or operation. An example is shown below.

FUNCTION/OPERATION	PROMPT
Edit an entry	Edit Field = [CR]
Select from multiple options	Scroll Through Options = [CR]
Select another menu	Select Menu = [CR]

3.5 Device Selection

The Device Selection Menu is displayed when a call is placed on the optional integral modem.

When no Dial-in password has been configured, this is the first screen displayed.

When a Dial-in password has been configured, this screen is displayed after the Dial-in password is correctly entered.

Do either of the following to make a selection:

- Type the number for a selection.
- Move the cursor to a selection and press **[CR]**.

Select one of the following:

Aux Port 0: Device 0 - access the Console/Aux port of a router or other compatible device connected to the Routermate's **CONSOLE** interface.

Aux Port 1: Device 1 - access the management screens of an FPX4802/DES Frame Relay Encryptor connected via the Routermate's **CONSOLE** interface.

T1 CSU/DSU - access the Routermate T1 D&I Main Menu.

Logoff - disconnect from the integral modem.

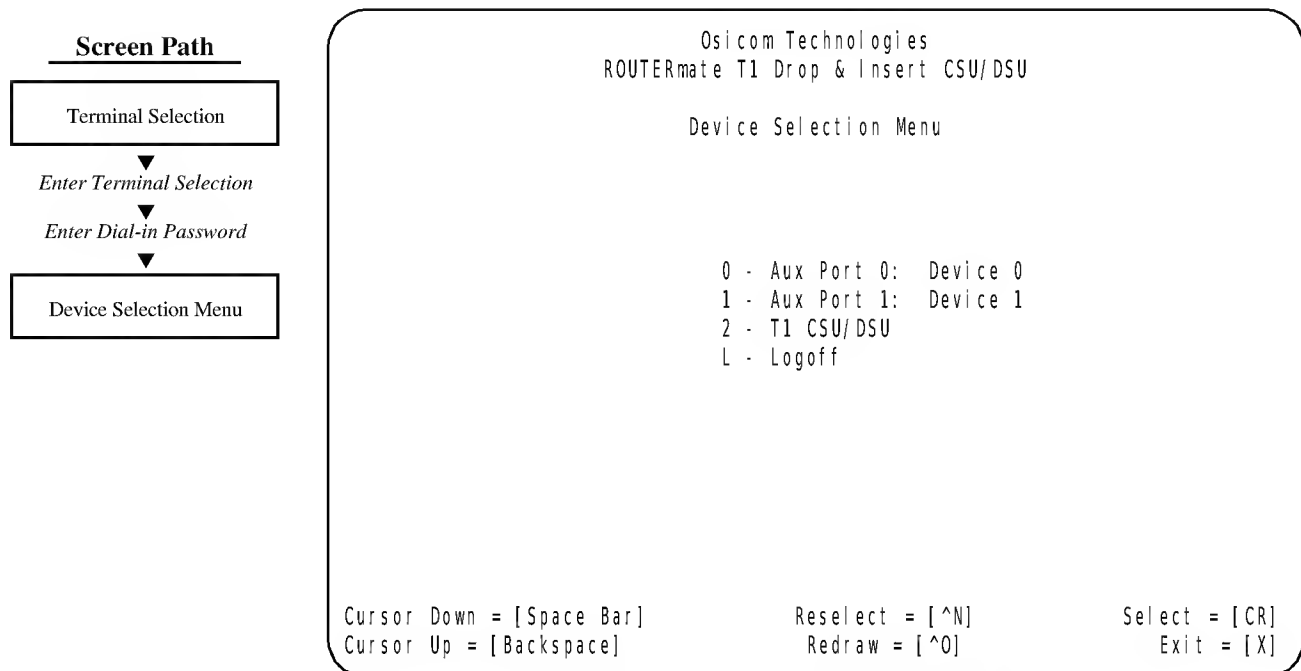


Figure 3-4. Device Selection Menu

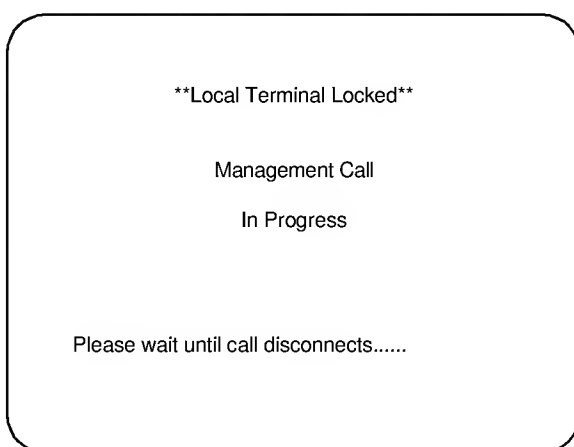
When the T1 CSU/DSU is selected, you are prompted:

Enter Password:

At this password prompt, enter the Console password. If no Console password has been configured, type **[CR]**. After correct entry, the Main Menu for the Routermate management screens is displayed.

Select **Logoff** at the Main Menu to disconnect from the Routermate management screens and return to the Device Selection Menu.

A dial-in management call locks out a local terminal connected to the Routermate's CONSOLE interface. While the call is connected, the local terminal displays:



3.5.1 Hot Keys

During a dial-in management call, use hot keys to switch between managed devices, as follows:

- [~] - Device Selection Menu.
- [~][#] - for #, substitute a number 0-2 as follows:
 - 0 - Device 0 connected to the CONSOLE interface (usually a router)
 - 1 - Device 1 connected to the CONSOLE interface (always an optional FPX4802/DES Frame Relay Encryptor)
 - 2 - Routermate management screens

The tilde (~) is referred to as an *escape character*. Other ASCII characters can be configured as the escape character (see [section 3.14, Unit Configuration, page 3-28](#)).

After other data is entered, there must be a 200-millisecond pause before a hot key is used.

Type a number 0-2 within 1.5 seconds of typing the escape character or you go to the Device Selection Menu.

When a hot key is used to return to a device, it returns to the same screen it originally left.

3.6 Main Menu

For terminal or Telnet access, the Main Menu (Figure 3-5) is displayed after the Console password is entered.

For dial-in management, the Main Menu is displayed after both the Dial-in password and the Console password are entered.

To make a selection from the Main Menu, press **[Space Bar]** or **[Back Space]** to move the cursor to the desired selection; then press **[CR]**.

Logoff

To exit the management screens type L, or position the cursor to **Logoff** and press **[CR]**.

This has one of the following effect, depending on how the management screens were accessed:

Terminal management - displays the Terminal Selection screen.

Telnet - disconnects the Telnet session on the **SLIP** port.

Dial-in Management - displays the Device Selection Menu.

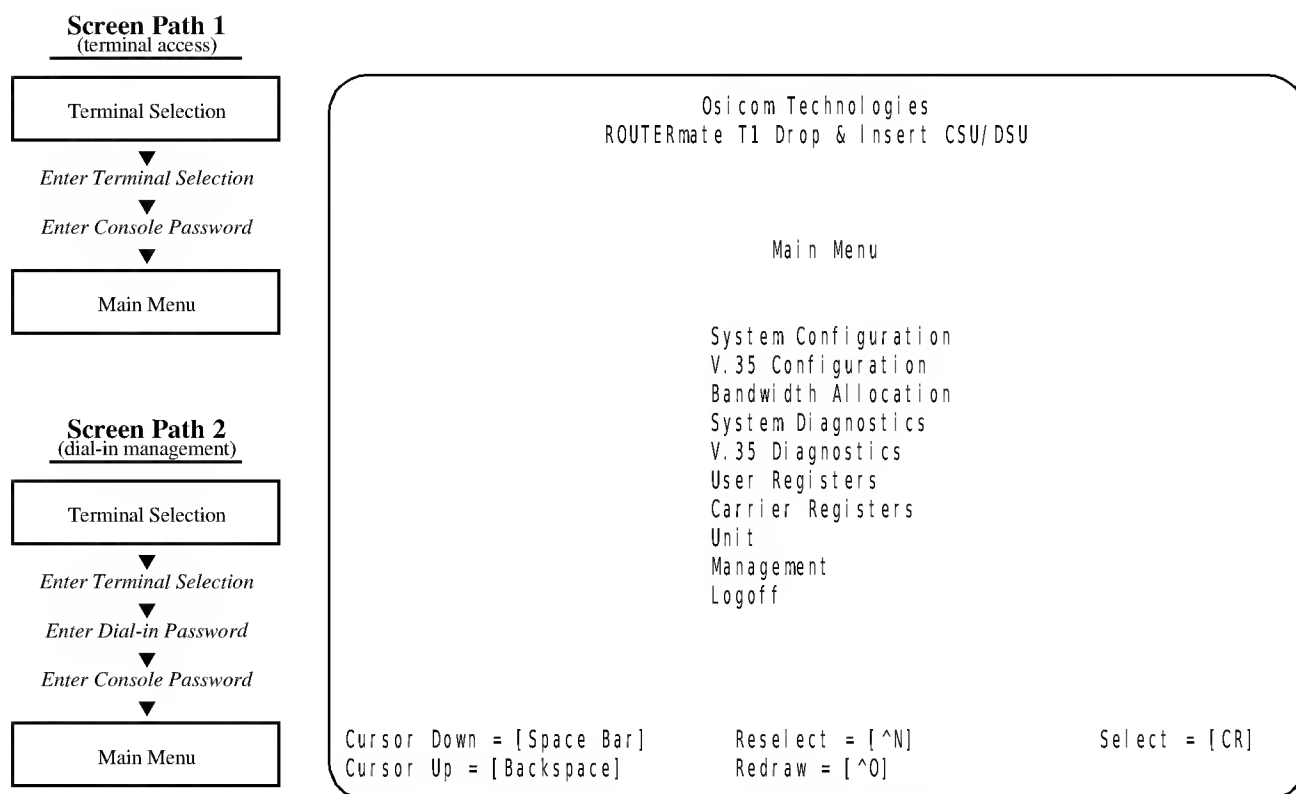


Figure 3-5. Main Menu

3.7 System Configuration

Use the System Configuration screen (Figure 3-6) to configure the network interface.

Prompts at the bottom of the screen change as necessary to show keys to use and actions to take. Position the cursor on the desired parameter and press **[CR]** to scroll through the available options.

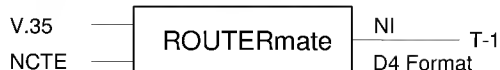
If you make changes, you are prompted to confirm the changes when you exit the screen. To save the changes, press **[Y]**.

[Default] - default settings are shown in Figure 3-6, and in brackets [] in the text.

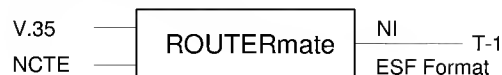
NI Format

This option sets the frame format for the network interface.

D4 - AT&T D4 Superframe standard, in which 12 T-1 frames make up a superframe.



ESF - AT&T TR 54016 Extended SuperFrame standard, in which 24 T-1 frames make up an extended superframe.



[Auto Detect] - automatically detects the type of framing on the line. When the Routermate is installed, the frame format is configured automatically. Resets upon:

- power-up
- transition from loss of signal to no loss of signal
- user selection and confirmation

The frame format detected is displayed in parentheses next to the Auto Detect option.

NOTE

If **NCTE Format** is set to *ESF*, **NI Format** should not be set to *D4* except by very knowledgeable users addressing specific applications.

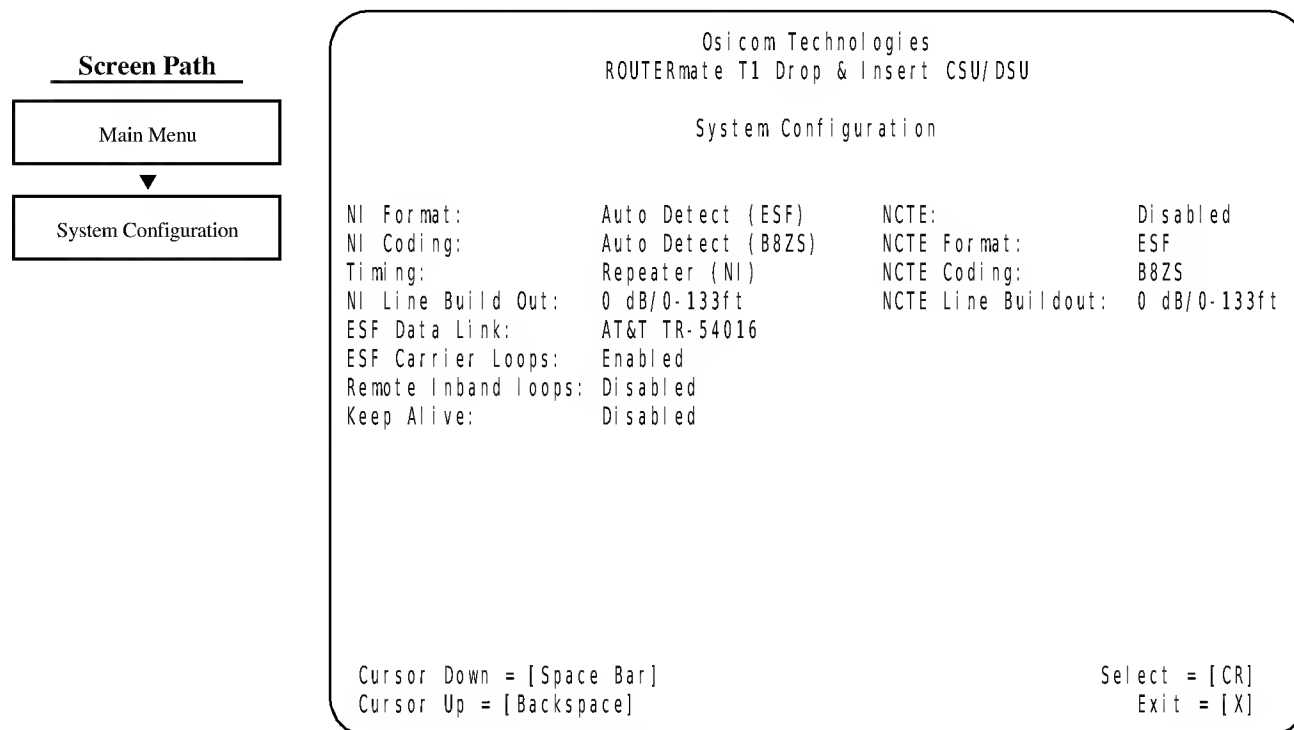


Figure 3-6. System Configuration Screen

NI Coding

This parameter selects the line coding mode and density for the network interface output.

AMI - 62411 - Alternate Mark Inversion; this mode assures that the transmitted data meets bit density requirements specified in AT&T Technical Publication 62411.

[Auto Detect] - automatically detects the type of coding on the line. When the Routermate is installed, the NI coding is configured automatically. Resets upon:

- power-up
- transition from loss of signal to no loss of signal
- user selection and confirmation

The coding detected is displayed in parentheses next to the Auto Detect option. B8ZS is not displayed until the B8ZS encoding pattern is received from the network.

B8ZS - Bipolar 8 Zero Substitution; this mode formats the data in such a way that it avoids bit density errors. In B8ZS mode, any data pattern (including an indefinite period of zeroes) can be transmitted without causing bit density errors; this is known as Clear Channel operation.

AMI - No Den(sity) - This mode will not enforce bit density requirements specified in AT&T Technical Publication 62411. This mode is provided for test purposes where disabling density requirements is desired.

NOTE

If **NCTE Coding** is set to *B8ZS*, **NI Coding** should not be set to *AMI* except by very knowledgeable users addressing specific applications.

Timing

This parameter sets the timing for the unit:

[Repeater (NI)] - always locked to the NI side.

Repeater (NCTE) - always locked to the NCTE side.

Internal - free-running.

External To V.35 - takes the clock from the V.35 interface's external TX clock. When this timing option is selected, the user should also set the channel's clocking parameter to INT RXC-EXT TXC.

NOTE

If this clock stops, the unit does not freerun. The NI goes into an alarm condition until the clock recovers or the setting is manually changed.

NI Line Build Out

The NI Line Build Out parameter varies the pulse shape and attenuation/gain of the signal sent to the network.

[0 dB/0-133ft]

7.5 db

15 db

22.5 db

133-266ft

266-399ft

399-533ft

533-655ft

ESF Data Link

ESF operation provides a 4 kbps data link channel transparent to user data. With ESF, the Telco Central Office can continuously monitor local loops, transmit and receive test messages, and retrieve performance statistics.

This parameter determines which variant of the data link protocol will be used. Select the protocol that matches the one used by the carrier. Contact your carrier to determine which protocol they are using.

[AT&T TR-54016]

ANSI T1.403

* *Not used*

* The *Not Used* option turns off unit responses to ESF data link messages; it does not make the data link transparent.

ESF Carrier Loops

This parameter enables the carrier to place the Routermate in either Line or Payload Loop via ESF data link messages from their management system.

[*Enabled*] - the Routermate will respond to ESF loop commands from the network provider.

Disabled - the Routermate will ignore ESF loop commands from the network provider.

Remote Inband Loops

This parameter enables the local Routermate to transmit and to respond to in-band Line Loop Up or Line Loop Down commands, or to proprietary in-band NCTE loop commands.

The Telephone Company and a remote CSU can send an in-band bit pattern causing the Routermate to go into a Line Loop. Select:

Enabled - local Routermate will transmit and respond to these commands from the network.

[*Disabled*] - local Routermate will not transmit or respond to these commands from the network.

When set to *Disabled*, the Remote NI Loop and Remote NCTE Loop commands (see pages 3-19 and 20) at the System Diagnostics and Statistics screen cannot be selected.

Keep Alive

Generates a keep-alive signal to the network if the attached NCTE equipment is disconnected or fails, as follows:

[*Disabled*] - D4 or ESF frames containing all ones in the data position are generated only in DS0's configured as *NCTE* (see Section 3.9, page 3-16). This setting also causes trunk processing options to be processed.

All Ones - an unframed signal of all ones is generated in all 24 DS0's.

Framed Ones - D4 or ESF frames containing all ones in the data positions are generated in all 24 DS0's.

Contact the carrier to determine which keep-alive signal type is required.

NCTE

This parameter options the NCTE port.

Enabled - passes data to and from the NI.

[*Disabled*] - forces all ones in DS0s assigned to NCTE.

NCTE Format

This option sets the frame format for the NCTE interface.

D4 - AT&T D4 Superframe standard, in which 12 T-1 frames make up a superframe.

[*ESF*] - AT&T TR 54016 Extended SuperFrame standard, in which 24 T-1 frames make up an extended superframe.

NOTE

If **NCTE Format** is set to *ESF*, **NI Format** should not be set to *D4* except by very knowledgeable users addressing specific applications.

NCTE Coding

The line coding mode and density for the NCTE interface output.

AMI - 62411 - Alternate Mark Inversion; this mode assures that the transmitted data meets bit density requirements specified in AT&T Technical Publication 62411.

[B8ZS] - Bipolar 8 Zero Substitution; this mode formats the data in such a way that it avoids bit density errors. In B8ZS mode, any data pattern (including an indefinite period of zeroes) can be transmitted without causing bit density errors; this is known as Clear Channel operation.

AMI - No Den(sity) - this mode will not enforce bit density requirements specified in AT&T Technical Publication 62411. This mode is provided for test purposes where disabling density requirements is desired.

NOTE

If **NCTE Coding** is set to *B8ZS*, **NI Coding** should not be set to *AMI* except by very knowledgeable users addressing specific applications.

NCTE Line Build Out

The NCTE Line Build Out parameter varies the pulse shape and attenuation/gain of the signal sent out the NCTE port.

[0 dB/0-133ft]

7.5 db

15 db

22.5 db

133-266ft

266-399ft

399-533ft

533-655ft

3.8 V.35 Configuration

Use the V.35 Configuration screen (Figure 3-7) to configure the V.35 interface.

If you make changes, you are prompted to confirm the changes when you exit the screen. To save the changes, press **[Y]**.

[Default] - default settings are shown in Figure 3-7, and in brackets [] in the text.

State

Set to:

[In Service] - data is passed between the V.35 interface and the DS0s assigned to the V.35 interface.

Out of Service - data is not passed between the V.35 interface and the DS0s that are assigned to the V.35 interface. The V.35 interface's received data lead is clamped to the mark state and all ones are sent to the network for any DS0s assigned to the V.35 interface.

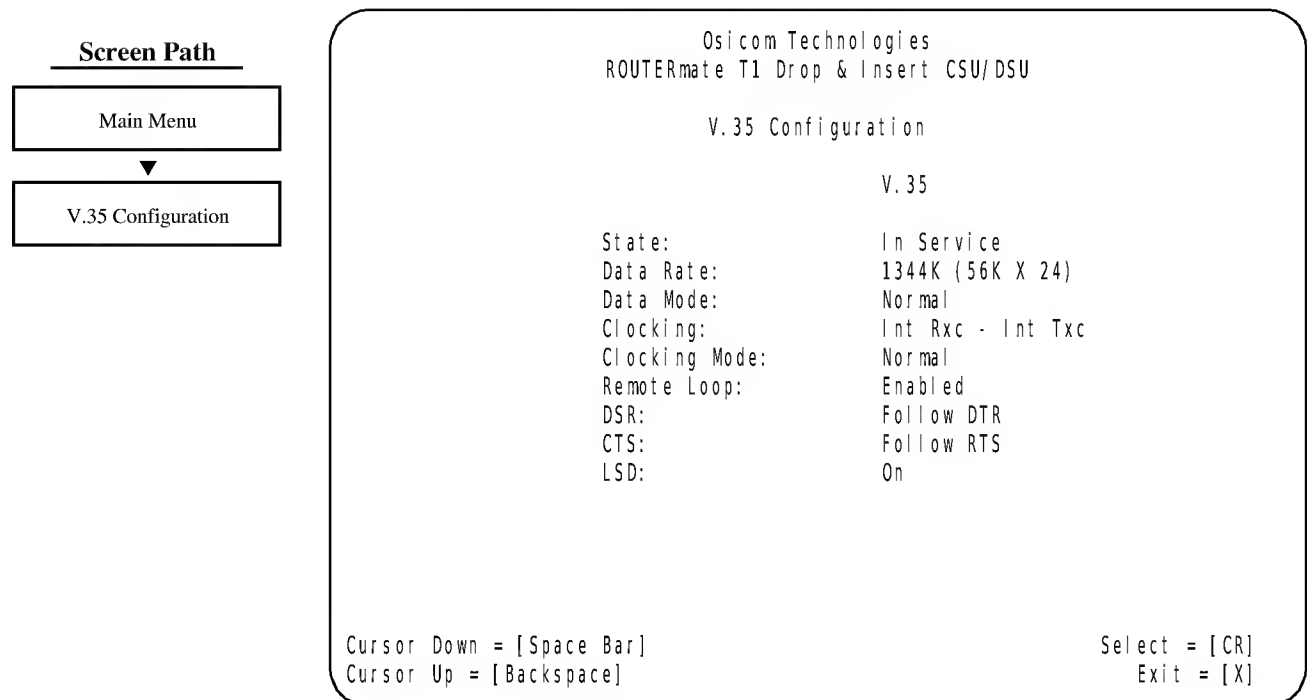


Figure 3-7. V.35 Configuration Screen

Data Rate

This option selects the speed for the V.35 interface.

The 24 speeds in multiples of 56 kbps are:

56k (56k x 01)	504k (56k x 09)	952k (56k x 17)
112k (56k x 02)	560k (56k x 10)	1008k (56k x 18)
168k (56k x 03)	616k (56k x 11)	1064k (56k x 19)
224k (56k x 04)	672k (56k x 12)	1120k (56k x 20)
280k (56k x 05)	728k (56k x 13)	1176k (56k x 21)
336k (56k x 06)	784k (56k x 14)	1232k (56k x 22)
392k (56k x 07)	840k (56k x 15)	1288k (56k x 23)
448k (56k x 08)	896k (56k x 16)	[1344k (56k x 24)]

The 24 speeds in multiples of 64 kbps are:

64k (64k x 01)	576k (64k x 09)	1088k (64k x 17)
128k (64k x 02)	640k (64k x 10)	1152k (64k x 18)
192k (64k x 03)	704k (64k x 11)	1216k (64k x 19)
256k (64k x 04)	768k (64k x 12)	1280k (64k x 20)
320k (64k x 05)	832k (64k x 13)	1344k (64k x 21)
384k (64k x 06)	896k (64k x 14)	1408k (64k x 22)
448k (64k x 07)	960k (64k x 15)	1472k (64k x 23)
512k (64k x 08)	1024k (64k x 16)	1536k (64k x 24)

The screen shows: the speed; whether the speed is a multiple of 56 or 64 kbps; and the total number of DS0s required to support that speed. You must also configure the number of DS0s required in the Bandwidth Allocation screen (see [Section 3.9, page 3-16](#)).

Selecting a multiple of 56 kbps positions user data in the first seven bits of every configured DS0. The eighth bit is forced to a one. This guarantees that the resulting data stream meets ones density requirements.

Selecting a multiple of 64 kbps positions user data in all eight bits of every configured DS0. This does not guarantee that the resulting data stream meets ones density requirements.

Setting the data rate to *Not Used* prevents the Bandwidth Allocation screen from indicating a bandwidth error when no DS0s are assigned to the V.35 interface.

Data Mode

When there are large numbers of zeros in the data stream, inverting the data may help meet the one's density requirement. The Data Mode parameter must be set the same at both ends of the network.

[Normal] - data is not inverted.

Inverted - data is inverted. Inverted data can be used only in transparent networks, which do not interpret user data. Inverted data cannot be used on frame relay networks or any other networks that interpret user data.

Long strings of zeros occurring in HDLC protocols can violate one's density. Zero insertion, a characteristic of HDLC protocols, prevents long strings of ones from occurring by inserting a zero after a string of five contiguous ones within a frame. Therefore, selecting *Inverted* should allow HDLC protocols to run at n x 64 the selected speed without density errors when AMI line coding is used.

Clocking

This parameter determines the timing used by the V.35 interface. The options are:

[Int Rxc-Int Txc] (Give RXC/Give TXC) - the V.35 interface gives both a transmit clock and receive clock to the DTE. The DTE (customer's equipment) uses the V.35 interface's transmit and receive clock for data transmission and reception.

Int Rxc-Ext Txc (Give RXC/Get TXC) - the V.35 interface gives the receive clock to the DTE and gets the transmit clock from the DTE. This setting is used for tail circuit and some excess cable length applications.

When you select *Int Rxc-Ext Txc*, also set **NI Timing** to *Ext to V.35* (see [Section 3.7, page 3-9](#)); otherwise errors might occur due to clock slips caused by having two clock sources.

Clocking Mode

Using a long cable on the V.35 interface might introduce delays which cause transmit data to get out of phase with transmit clock. Selecting *Inverted* will place transmit clock 180° out of phase with receive clock; this may prevent these errors.

[Normal] - Tx clock is not inverted.

Inverted - Tx clock is inverted.

Remote Loop

[Enabled] - V.35 interface will respond to V.54 loop commands from the remote synchronous channel.

Disabled - V.35 interface will not respond to loop commands from the remote synchronous channel.

DSR

[Follow DTR] - Data Set Ready follows Data Terminal Ready.

On - Data Set Ready always On.

Off if NI Alarm - Data Set Ready turned off during NI alarms.

CTS

[Follow RTS] - Clear to Send follows Request to Send.

On - Clear to Send always On.

Off if NI Alarm - Clear to Send turned off during NI alarms.

LSD

[On] - Line Signal Detect always On.

Off if NI Alarm - Line Signal Detect turned off during NI alarms.

3.9 Bandwidth Allocation

At the Bandwidth Allocation screen (Figure 3-8), assign DS0s to the V.35 interface and the NCTE interface. The number of DS0s that must be assigned is determined by the speed chosen (see **Data Rate** parameter, Section 3.8, page 3-13). Use the DS0s assigned by the carrier.

Position the cursor on the desired DS0 # and press [CR] to select:

Not Used - all ones are sent toward the network.

[V.35] - data is passed between the V.35 interface and the assigned DS0s.

NCTE/Data - data is passed between the NCTE interface and the assigned DS0s.

NCTE/A=0 B=0
NCTE/A=0 B=1
NCTE/A=1 B=0
NCTE/A=1 B=1

Voice is passed between the NCTE interface and the assigned DS0; in the event of a Red, Blue, or Yellow alarm, frames that have the A and B bits set as selected are sent toward the NI interface.

The voice selections include trunk processing, which should be selected as follows to fit the application:

<i>Application</i>	<i>Selection</i>
E&M Busy	A=1 B=1
E&M Idle	A=0 B=0
GS and LS FXS Idle	A=0 B=1
GS FXO Busy No TG and Ringing ..	A=1 B=0
GS FXO Busy Tip Ground	A=0 B=1
GS FXO Busy TG and Ringing	A=0 B=0
GS FXO Idle	A=1 B=1
GS FXS Busy Ring Ground	A=0 B=0
GS FXS Busy Loop Closure	A=1 B=1
LS FXO Busy	A=0 B=0
LS FXO Idle	A=0 B=1
PLAR Busy	A=0 B=0
PLAR Idle	A=1 B=1

NOTE

For trunk processing to operate, **Keep Alive** at the System Configuration screen must be set to *Disabled*; if not, the keep alive signal over-rides the selected trunk processing.

Observe the *Bandwidth Status* prompt to confirm that bandwidth is allocated correctly. If you make changes, you are prompted to confirm the changes when you exit the screen. To save the changes, press [Y].

Screen Path

Main Menu



Bandwidth Allocation

```

Osicom Technologies
ROUTERmate T1 Drop & Insert CSU/DSU

Bandwidth Allocation

DS0      DS0
1 V.35   13 V.35
2 V.35   14 V.35
3 V.35   15 V.35
4 V.35   16 V.35
5 V.35   17 V.35
6 V.35   18 V.35
7 V.35   19 V.35
8 V.35   20 V.35
9 V.35   21 V.35
10 V.35  22 V.35
11 V.35  23 V.35
12 V.35  24 V.35

Bandwidth Status : Bandwidth is allocated correctly

Cursor Down = [Space Bar]      Scroll Through Options = [CR]
Cursor Up   = [Backspace]      Exit = [X]

```

Figure 3-8. Bandwidth Allocation Screen

3.10 System Diagnostics and Statistics

Use page 1 (Figure 3-9) of the System Diagnostics and Statistics screens to perform diagnostics and monitor statistics (alarm conditions). Use page 2 to display a summary of ESF events (page 3-22).

Press **[P]** to toggle between pages 1 and 2.

To start a loopback, send a test pattern, or insert a bit error, follow the key prompts at the bottom of page 1.

Position the cursor on the desired option and press **[CR]** to activate or de-activate the selection.

Press **[C]** to reset to zero all counters on the first page of this screen and the user **ESF Error Event** counter on the second page.

NOTE

SNMP: The MIB uses four separate clear commands to reset NI error events, NCTE error events, Seconds In Test/Seconds in Error, or all counters (including **Last Reset Time**).

3.10.1 Loopback Tests

User Controls and Indicators

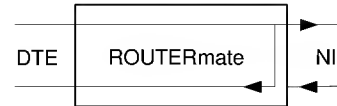
For each loop test, there is a control field and an indicator field.

On or Off (control) - set by the user to indicate the desired state of the loopback.

Yes or No (indicator) - indicates the actual state of the loopback (whether the unit has responded to the loop command).

Figure 3-10 on page 3-18 shows the locations of the test pattern generator, loopback, and framer.

Local NI Loop



011A

The Local NI Loop test makes sure the CSU is operating properly. All DS0s are looped back when an NI loopback is set.

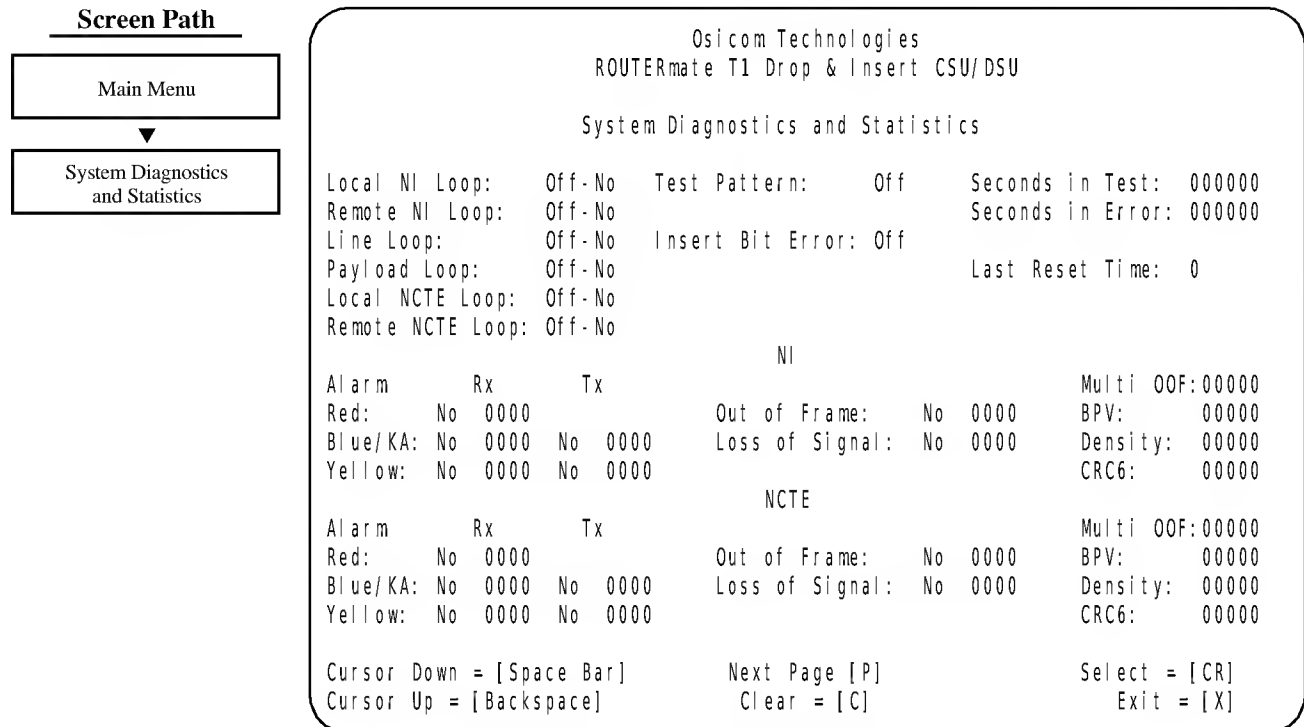


Figure 3-9. System Diagnostics and Statistics Screen

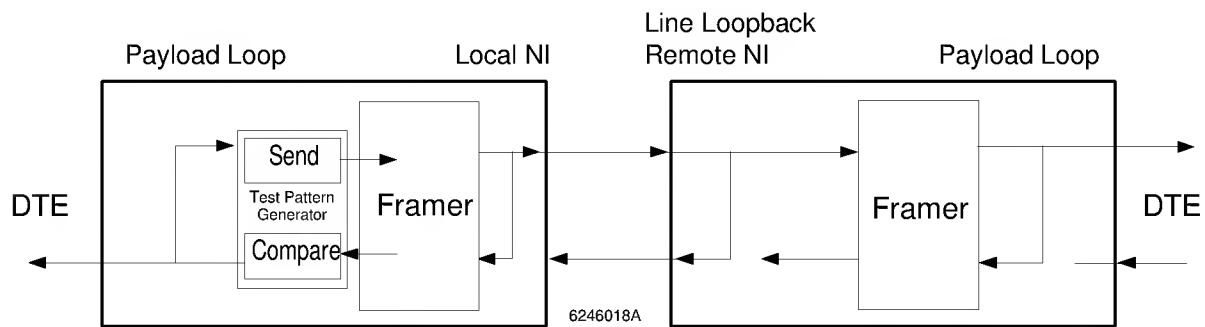
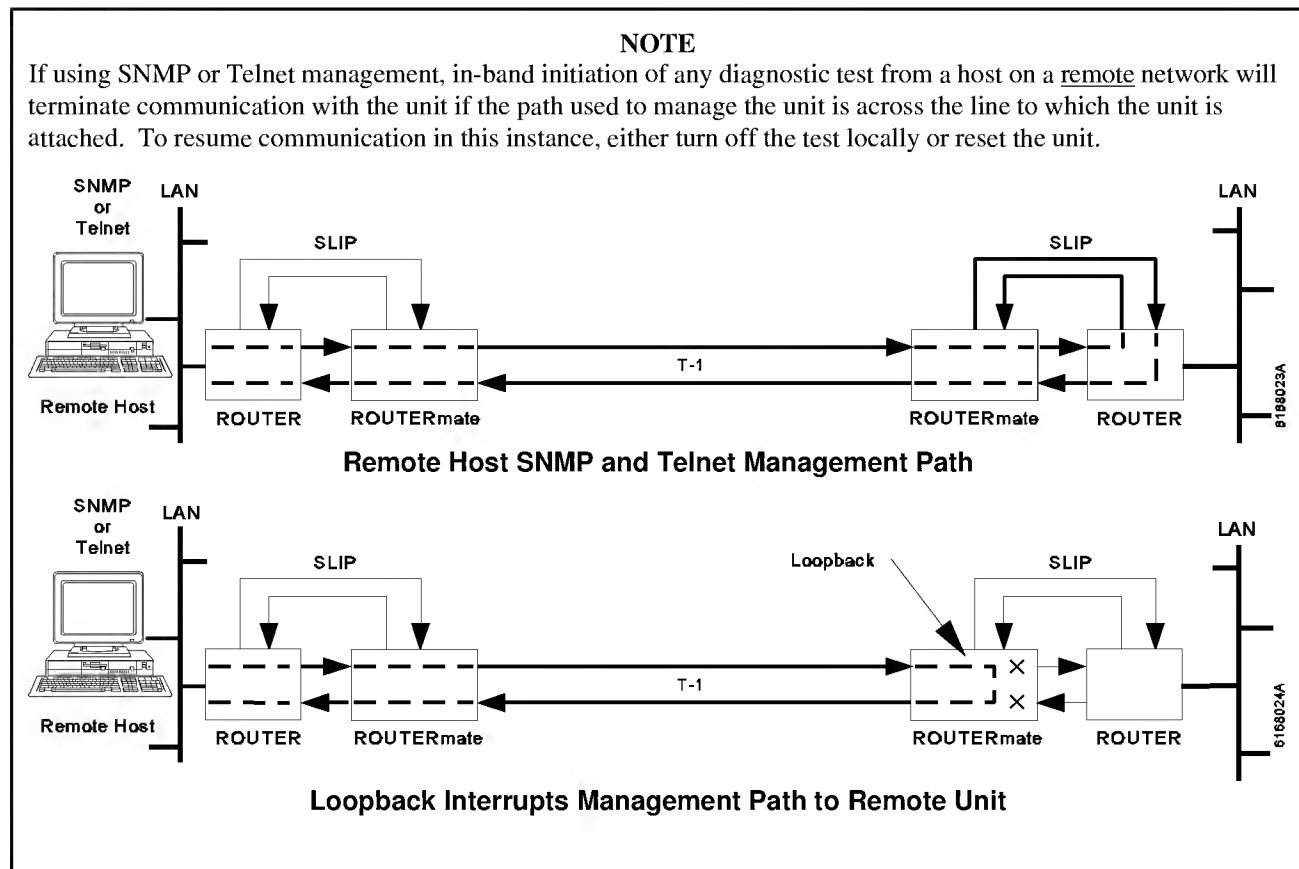
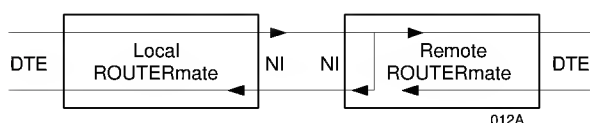


Figure 3-10. Test pattern Generator, Loopback, and Framers Locations



Remote NI Loop

Remote NI Loop generates a full-rate inband test pattern toward the network, which puts the remote unit in Line loopback. All DS0s are looped back when a Line loopback is set.



If the Remote NI Loop pattern does not come back, either:

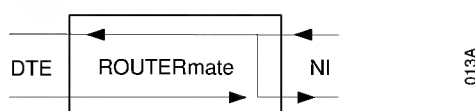
- a remote loopback has not occurred,
- the remote unit is configured not to respond to remote inband loop commands (see [page 3-11](#)), or
- the local unit can not recognize the pattern.

In this case, the User Controls will display On-No, indicating the local unit cannot recognize the remote unit's loopback state.

The same is true in reverse. That is, if you set the User Control to Off (to turn the test off), but the Indicator still displays Yes, the remote unit could still be in loopback.

Line Loop

A Line Loop transmits back to the network exactly what is received, unchanged.



A Line Loop can also be set by a bit pattern sent from the carrier or the remote Routermate, or by a message sent by the carrier on the ESF Data Link.

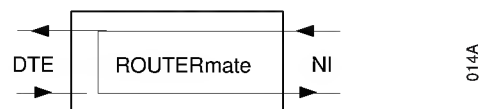
Off-No - indicates a Line Loopback is *not* set.

Off-Yes - indicates a Line Loopback was set by the carrier or remote Routermate.

On-Yes - indicates a Line Loopback was set locally.

Payload Loop

A Payload Loop transmits back to the network what is received on all 24 DS0s, but the signal is reframed. A Payload Loop can also be set by a message sent by the carrier on the ESF Data Link.



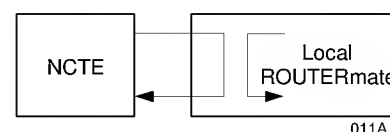
Off-No - indicates a Payload Loop is not set.

Off-Yes - indicates a Payload Loop was set by the carrier.

On-Yes - indicates a Payload Loop was set locally.

Local NCTE Loop

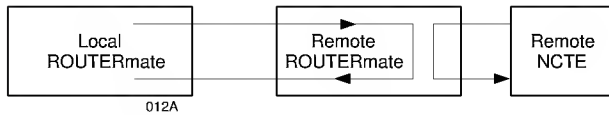
The Local NCTE Loop test makes sure the NCTE is operating properly; it is a bi-directional loopback. Only DS0s assigned to the NCTE port are looped back when an NCTE loopback is set. An NCTE Loopback transmits back to the network what is received. Press **Enter** to toggle the test ON and OFF.



If the control field shows the loop is off, but the indicator field shows the loop is on, the NCTE loop was generated by the Routermate at the other end of the link.

Remote NCTE Loop

Turning on this test generates a proprietary in-band bit pattern (to the NI side) for six seconds, putting the remote unit in Local NCTE loopback.



If the pattern does not come back, either a remote loopback has not occurred or the local unit cannot recognize the pattern. In this case, the control field remains on and the indicators field displays *No*, indicating that the local unit cannot determine the remote unit's loopback state.

The same is true in reverse. That is, if you set the control field to *Off* (to turn the test off), but the indicator field still displays *Yes*, the remote unit might still be in loopback.

Test Pattern

Press **Enter** to toggle through the available test patterns:

QRSS, Frmd 1's, Min Den, Off

When the test pattern generator is enabled, the test pattern is placed in all 24 DS0s and sent toward the network interface. See [Figure 3-10](#).

The QRSS test pattern will cause density errors if the coding is AMI and the density is AT&T 62411.

Insert Bit Error

Use this parameter to insert bit errors into the test pattern. Typically, it is used to ensure that the test pattern generator will detect errors.

To insert a bit error, press **[CR]**; *On* will appear, letting you know that the bit error was inserted. After about half a second, the display automatically toggles to *Off*.

Seconds In Test

This is the length of time the test pattern has been enabled. Range is 0 - 999,999.

Seconds In Error

Displays the number of seconds an error was detected in the test pattern. Range is 0 - 999,999.

Last Reset Time

The **[C]**lear command resets all counters on the screen. This parameter indicates the time (HH:MM) since the **[C]**lear command was executed or the unit was reset. Last reset range is 00:00 - 999:59.

3.10.2 Alarms

There are three alarm conditions for the NI and NCTE interfaces: Red, Blue, and Yellow. Each alarm has an indicator and a counter. The indicator (No or Yes) reports if the alarm currently exists. The counter indicates the number of seconds the alarm has existed since the last reset.

The Rx side refers to the receive pair from the network and the Tx side refers to the transmit pair to the network. Since alarms can occur on both sides, this screen shows you exactly where the alarm is occurring.

Red

A Red Alarm condition exists when there is a loss of signal or the incoming signal is out of frame for at least 2.5 seconds. In the Red Alarm state, a Yellow Alarm signal is transmitted toward the source of the Red Alarm until the Red Alarm no longer exists.

NOTE

If the NCTE interface is in red alarm, it transmits a yellow alarm only if the network interface is receiving a yellow alarm.

Blue/KA

A Blue Alarm condition exists when an unframed all-ones (keep-alive) signal is transmitted or received.

If the **Keep Alive** option at the System Configuration screen is set to *Framed Ones*, this counter indicates that a frame-ones keep-alive signal is being transmitted.

Yellow

In ESF mode, a Yellow Alarm exists when a repeating pattern of eight ones followed by eight zeroes is sent on the data link for a minimum of one second.

In D4 mode, a Yellow Alarm is a condition that occurs when bit two in each DS0 is set to zero. A Yellow Alarm indicates the equipment at the opposite end of the line from the interface receiving the yellow alarm is out-of-frame or out-of-sync on its receive pair (in Red Alarm).

3.10.3 NI and NCTE Alarm Indicators

The following alarm indicators refer to the received signal on the NI or NCTE interface. Each alarm has an indicator and a counter. The indicator (No or Yes) reports if the alarm currently exists. The counter indicates the number of seconds the alarm has existed since the last reset.

Out of Frame

This condition is declared when the unit senses errors in the framing pattern. This occurs when any 2 of 4, any 2 of 5, or any 3 of 5 consecutive framing bits received contain bit errors in the framing pattern. OOF condition clears when reframing occurs.

Loss of Signal

This condition is declared when the unit detects 175 (± 75) successive pulse positions with no pulse of either positive or negative polarity.

3.10.4 Error Counters

All error counters except **Density** display the number of times a particular error event has occurred since the last reset. The density counter displays the number of seconds since the last reset. The range for all counters is 0 - 99,999.

Multi OOF

This is the number of Out of Frame errors. This condition may be declared when the unit senses that more than 1 framing bit in the received Extended Superframe or the received Superframe is in error.

BPV

Displays the number of Bipolar Violations in the received signal. This condition is declared when consecutive pulses are of the same polarity.

Density

Displays the number of seconds the unit has been inserting ones to ensure that the transmitted signal meets minimum bit density requirements. Ones are inserted as required if NI or NCTE coding is set to *AMI-62411*.

CRC6 (ESF Mode)

A Cyclic Redundancy Check (CRC) is performed on each received extended superframe to make sure it agrees with CRC6 field in the received frame. If it is not the same, a CRC error is generated.

CRC6 is not supported in D4 mode.

3.10.5 ESF Error Summary

Press **[P]** at the System Diagnostics and Statistics screen to display the second page of this feature (Figure 3-11).

This page displays the current interval and the 24-hour-total summaries for both the user and carrier registers.

To reset the user register counters, press [C]lear on the User Registers screen. The carrier registers can be reset only by the carrier.

Press **[P]** to return to the first page of the System Diagnostics and Statistics screen.

Valid Interval

Indicates how many complete 15 minute (900 second) periods have occurred. Range is 0 - 96.

Elapsed Seconds

This is the number of seconds that have passed in the current interval. Range is 0 - 900.

ESF Error Event

This condition is defined as an ESF that contains either a CRC 6 error, an Out of Frame (OOF), or both. Range is 0 - 65,535.

Unavailable Signal State

A '1' indicates the start of 10 seconds of Severely Errored Seconds. A '0' indicates normal operation.

Errored Seconds

The number of errored seconds that contained one or more ESF error events. Current range: 0 - 900; 24-hour range: 0 - 65,535.

Unavailable Seconds

Unavailable Seconds are displayed after ten consecutive Severely Errored Seconds. Current range: 0 - 900; 24-hour range: 0 - 65,535.

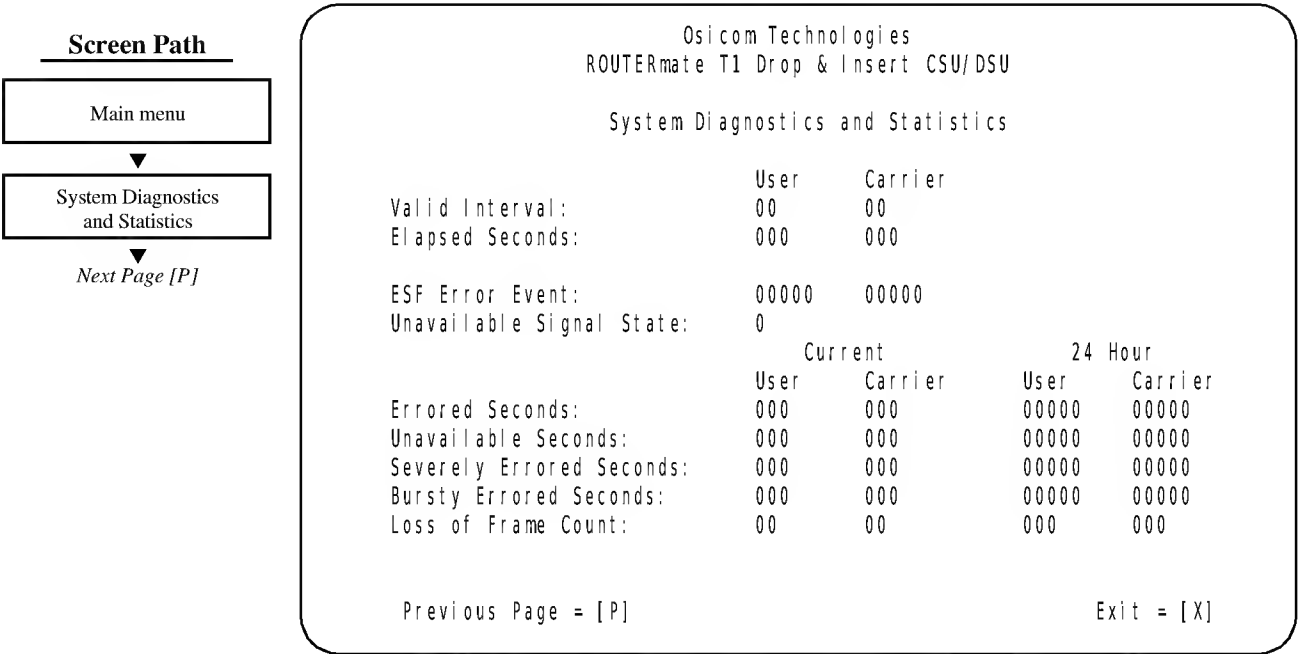


Figure 3-11. Statistics and Alarms Screen

Severely Errored Seconds

The number of errored seconds that have at least 320 CRC 6 errors or one or more OOF (Out Of Frame) errors. Current range: 0 - 900; 24-hour range: 0 - 65,535.

Bursty Errored Seconds

The number of errored seconds that have more than one but less than 320 CRC 6 errors. Current range: 0 - 900; 24-hour range: 0 - 65,535.

Loss Of Frame Count

The accumulation of the number of times a Loss of Frame has occurred. Current range: 0 - 90; 24-hour range: 0 - 255.

3.11 V.35 Diagnostics

The V.35 Diagnostics screen (Figure 3-12) lets you monitor present conditions and perform diagnostics on the V.35 interface.

IMPORTANT

If using SNMP or Telnet management, in-band initiation of any diagnostic test from a host on a remote network will terminate communication with the unit if the path used to manage the unit is across the line to which the unit is attached.

To resume communication in this instance, either turn off the test locally or reset the unit.

3.11.1 Diagnostic Tests

For each loop test, there is a Control and an Indicator.

On or *Off* (Control) - set by the user to indicate the desired state of the loopback.

Yes or *No* (Indicator) - indicates the actual state of the loopback (whether or not the unit has responded to the loop command).

Press **[C]** to reset the Seconds In Test and Seconds In Error counters.

Figure 3-13 illustrates the test pattern generator and channel loopbacks.

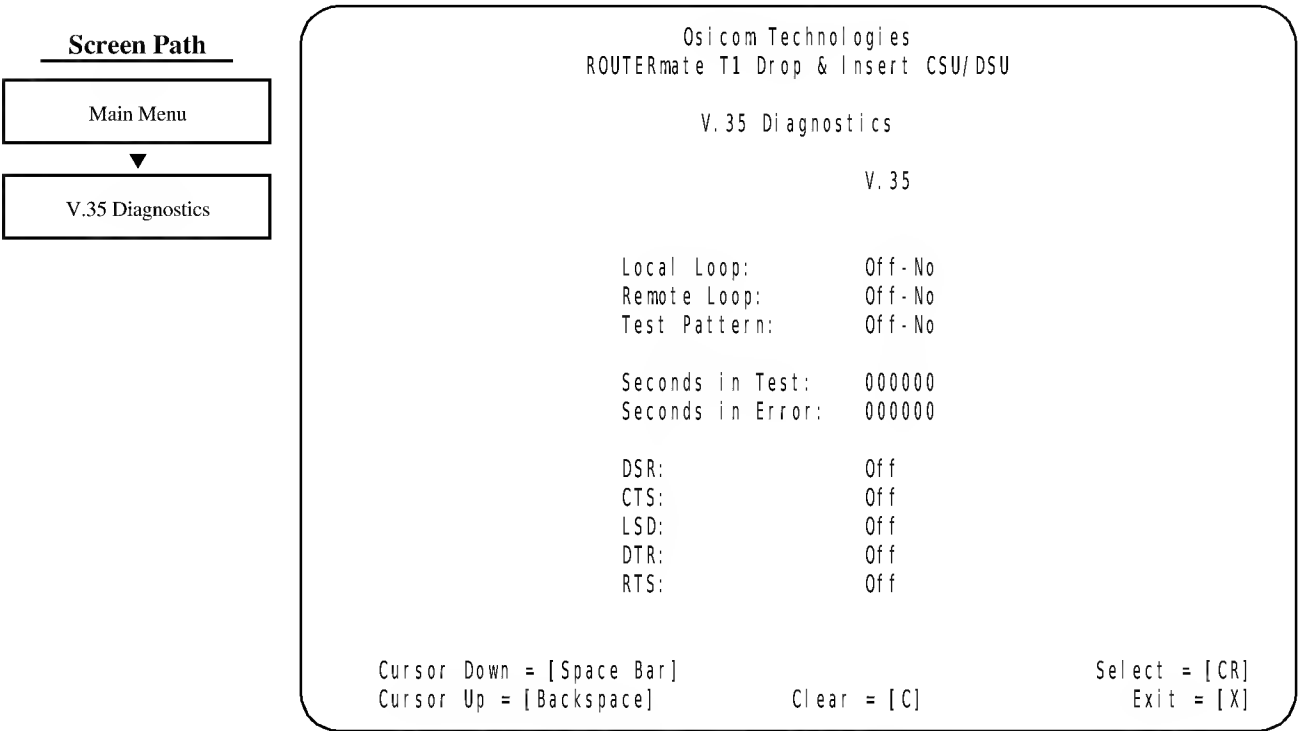


Figure 3-12. V.35 Diagnostics Screen

Local Loop

This test is a bi-directional loop that is used to verify that the V.35 interface is operating properly.

NOTE

When the control and indicator fields show *off-yes*, the V.54 loop command was received from the telephone company or from a remote unit.

3.11.2 Status

Whether control leads from the V.35 interface are on or off is indicated for the following:

- DSR** - Data Set Ready
- CTS** - Clear To Send
- LSD** - Line Signal Detect
- DTR** - Data Terminal Ready
- RTS** - Request To Send

Remote Loop

This test sends a V.54 pattern to the remote unit, which puts the V.35 interface in local loop.

Test Pattern

This parameter lets you enable the test pattern generator. Enabling this option causes a 511 test pattern to be sent toward the remote unit. The test pattern generator is in front of the local channel loop; therefore the test pattern will not be looped if only a local channel loopback is set.

Press **[CR]** to toggle the test pattern On (511) or Off.

Seconds In Test

Displays the length of time the test pattern has been enabled. Range is 0 - 999,999.

Seconds In Error

Displays the number of seconds during which an error was detected in the test pattern. Range is 0 - 999,999.

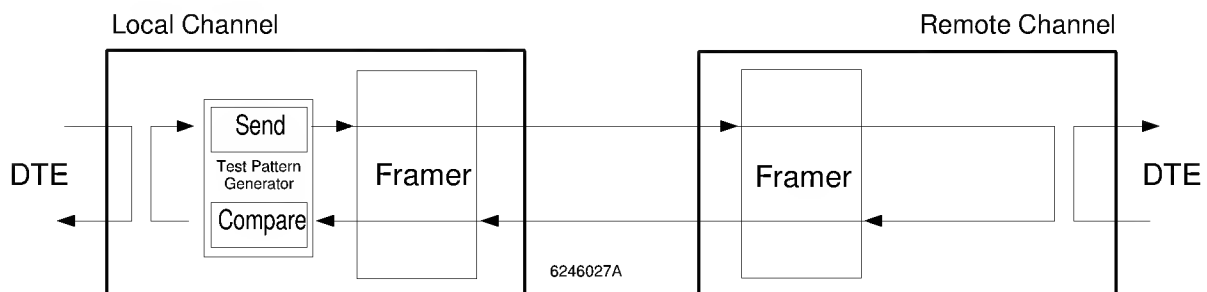


Figure 3-13. Test Pattern Generator and Channel Loopbacks

3.12 User Registers

The User Registers (Figure 3-14) is an informational display (ESF only) that allows you to view the status of the ESF link over a 24-hour period in 15 minute intervals. The screen displays a summary of the error events as discussed in [Section 3.10.5 \(page 3-22\)](#), ESF Error Summary. Interval 01 is the most current interval. The range for ES, UAS, SES, and BES is 0 - 900. The range for LOFC is 0 - 90.

- 1. Press **[P]** to view registers 49 to 96.
- 2. Clear the registers by pressing **[C]**.

Clearing the counters on this screen resets all 96 intervals and also clears the statistics from the Current and 24 Hour columns in the second page of the System Diagnostics and Statistics screen.

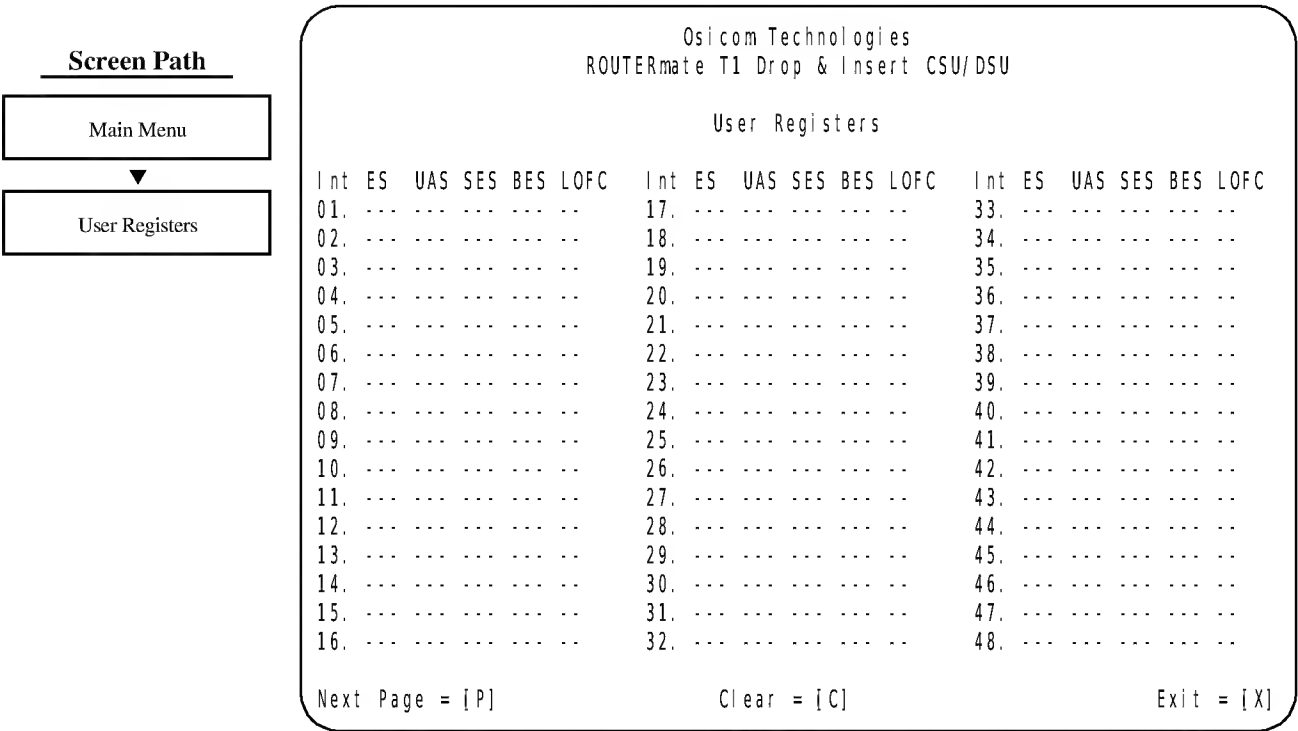


Figure 3-14. User Registers Screen

3.13 Carrier Registers

The Carrier Registers screen (Figure 3-15) is an informational display (ESF only) that allows you to view the status of the ESF link over a 24-hour period. This is the same information that would be sent to the carrier (Telco) if requested. The screen displays a summary of the error events as discussed in [Section 3.10.5 \(page 3-22\)](#), ESF Error Summary. Interval 01 is the most current interval.

Press **[P]** to view registers 49 to 96.

NOTE
The values in the registers on the carrier screens are cleared only by Telco.

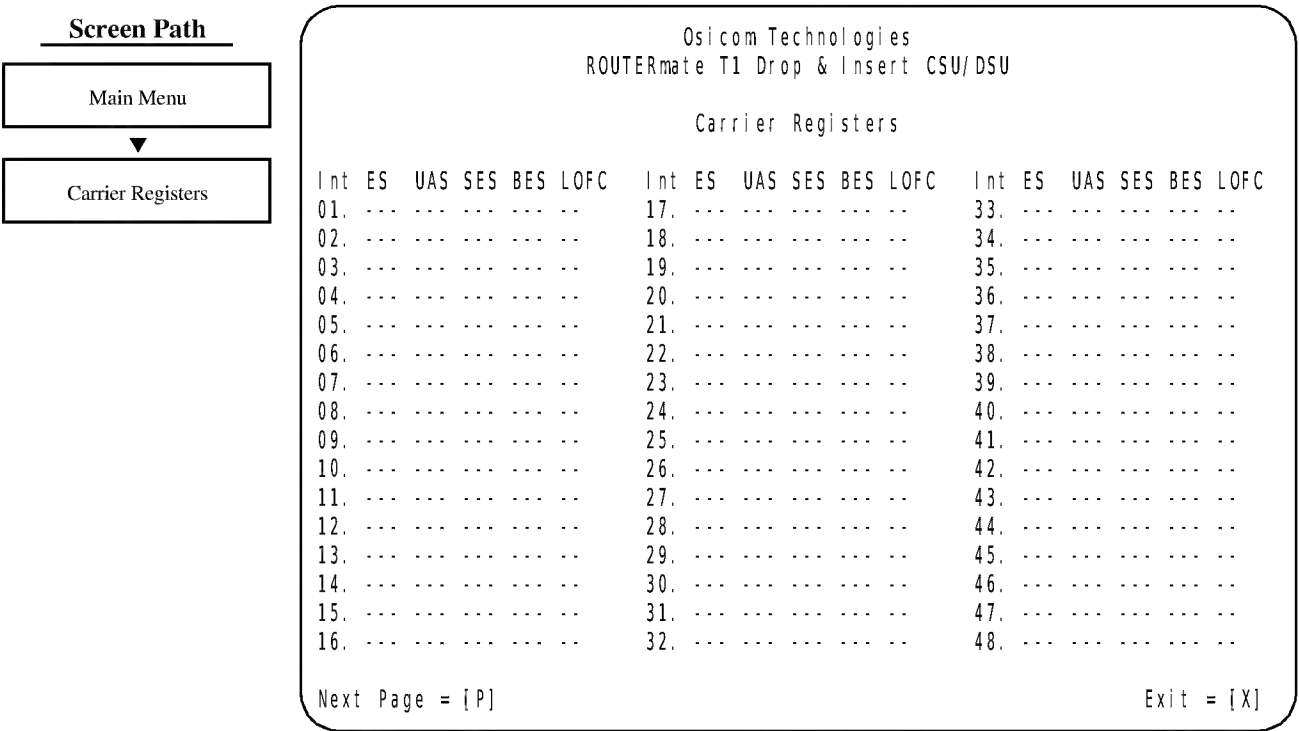


Figure 3-15. Carrier Registers Screen

3.14 Unit Configuration

At the Unit screen, configure supervisory and unit control information. As shown in Figure 3-16, additional options are available when the integral V.32 modem is installed.

If you exit the screen after making changes, you are prompted to confirm the changes.

Header Line 1

Sets the header line that appears at the top of each screen.

The new header is displayed after you confirm the configuration and exit the screen.

Valid input: Up to 40 alphanumeric characters.

Default: *Osicom Technologies*

Header Line 2

Sets the header line that appears on the second line of each screen.

The new header is displayed after you confirm the configuration and exit the screen.

Valid input: Up to 40 alphanumeric characters.

Default: *ROUTERmate T1 Drop & Insert CSU/DSU*

Console Password

Restricts access to the management screens.

User is prompted to enter this password after selecting a terminal type.

When **Logoff** is selected at the Main Menu, this password must be entered before the Main Menu can be accessed again.

During a dial-in management call, the user is prompted to enter this password after selecting T1 CSU/DSU at the Device Selection Menu for the first time during a call; password re-entry is not required for subsequent selections during the same call.

Valid input: Up to eight alphanumeric characters, case sensitive.

Default: *[CR]*

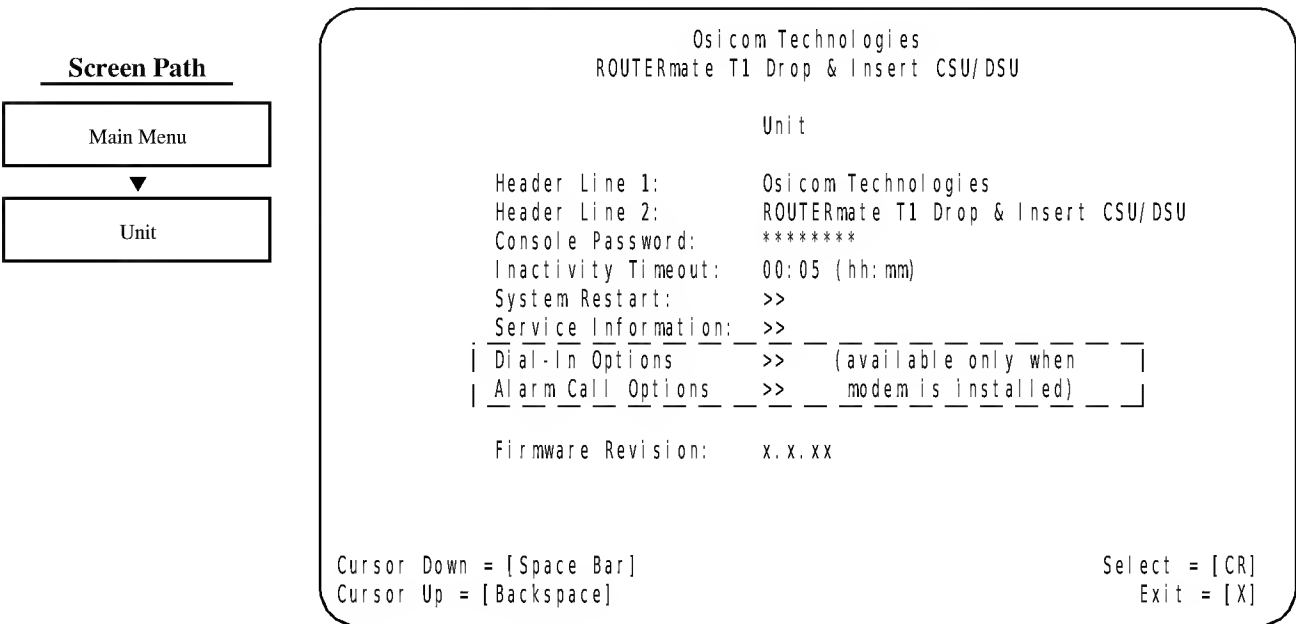


Figure 3-16. Unit Screen

Inactivity Timeout

Specifies the time that elapses before the console is deactivated, or the Telnet connection is disconnected. If there is no keyboard activity during the specified time, the console is deactivated and access is restricted to users who enter the password. This security feature reduces the opportunity for unauthorized access to the management screens.

NOTE

Dial-in management: The inactivity timer also disconnects a modem connection, regardless of the device selected.

Enter the hours and minutes in *hh:mm* format. You do not need to type the colon.

The maximum time is 23:59. Set the time to 00:00 to disable this feature.

Defaults: non-modem model: 00:05 (hh:mm)
modem model: 00:00 (hh:mm)

Firmware Revision

Firmware revision level for the unit.

3.14.1 System Restart

The System Restart screen (Figure 3-17) supports two types of restarts.

System Restart

Equivalent to powering the Routermate off and on. Configuration parameters are not affected.

Defaults Restart

Select this option to change all configuration parameters to their default values.

NOTE

If Defaults Restart is selected, an active Telnet session will be closed. You must re-enter the IP address from a local terminal before you can make another Telnet connection.

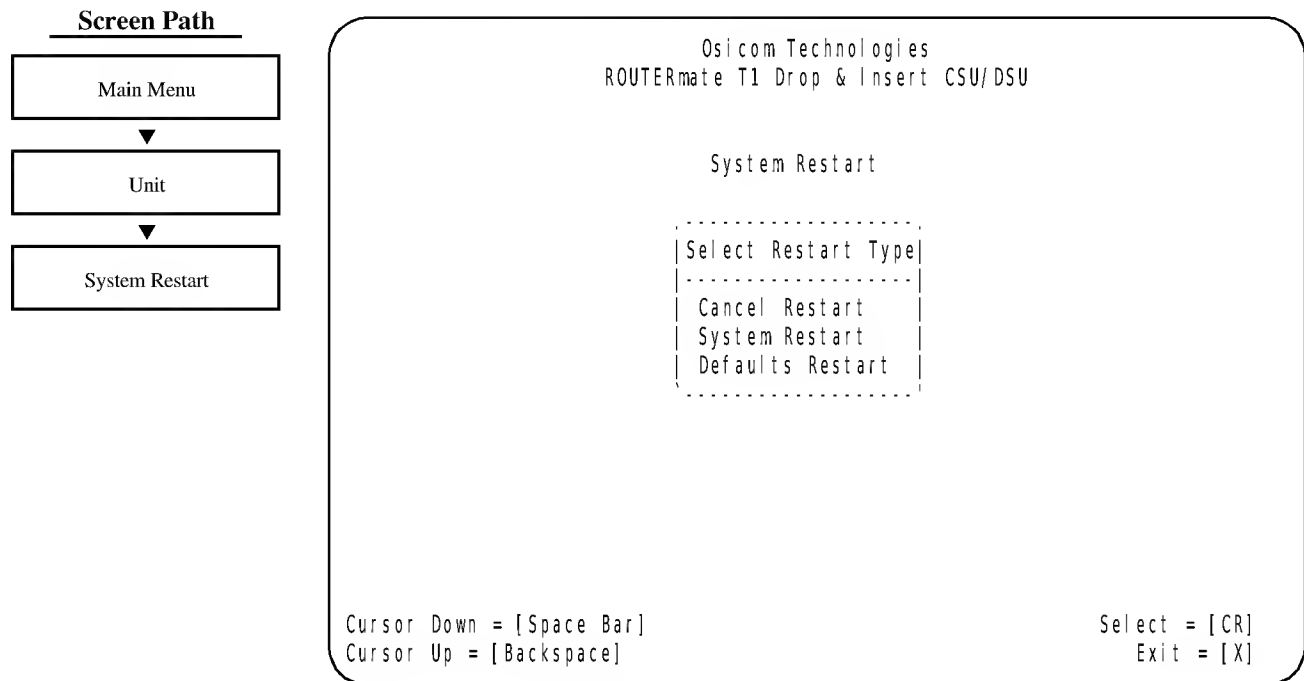


Figure 3-17. System Restart Screen

3.14.2 Service Information

The Service Information screen displays information to assist you in contacting Osicom's Customer Support staff for technical assistance (Figure 3-18).

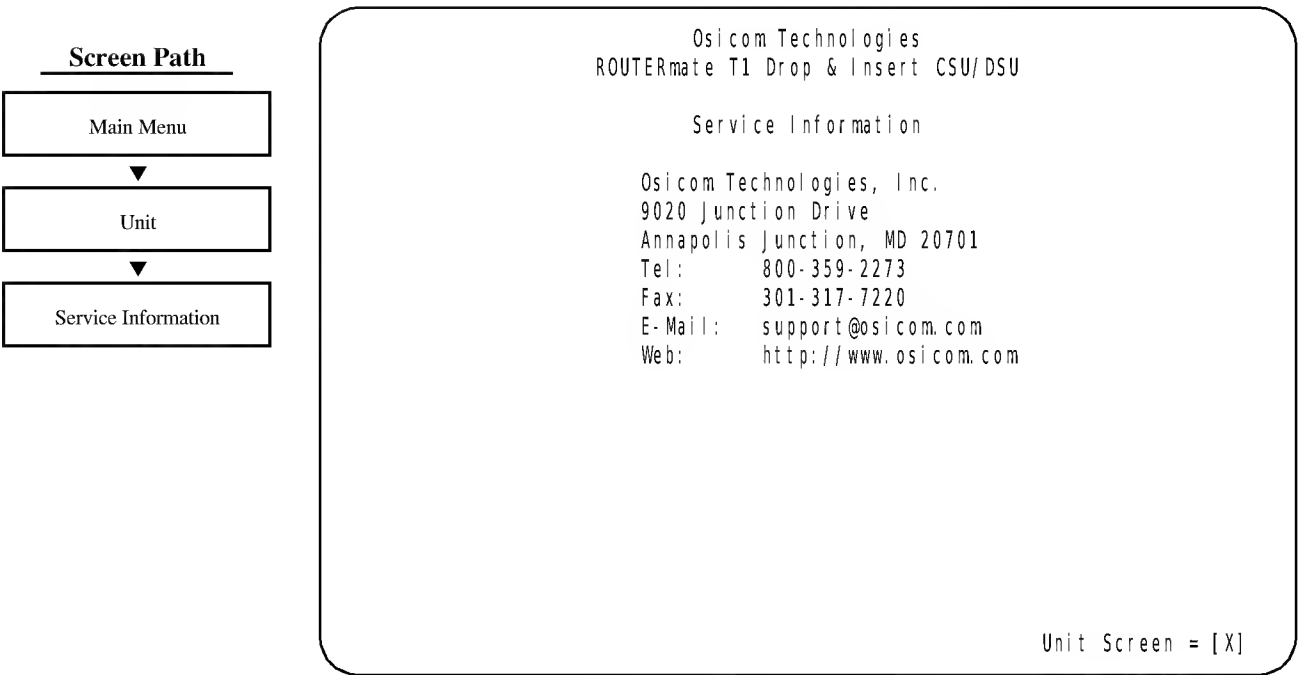


Figure 3-18. Service Information Screen

3.14.3 Dial-In Management Options

Access the Dial-In Management Options screen (Figure 3-19) to configure options for the integral modem.

NOTE

This screen is accessible only when a modem is installed.

Auto Answer

Determines whether the modem answers incoming calls. If **Auto Answer** is disabled, the modem will not answer the incoming call. This prevents dial-in management.

Default: *Enabled*

Connection Delay

Defines, in seconds, the delay before displaying the Terminal Selection screen. The connection is an interval between going off-hook and sending data. It avoids data loss while the modems get completely trained up.

Valid input: 0 to 30 seconds

Default: *6 seconds*

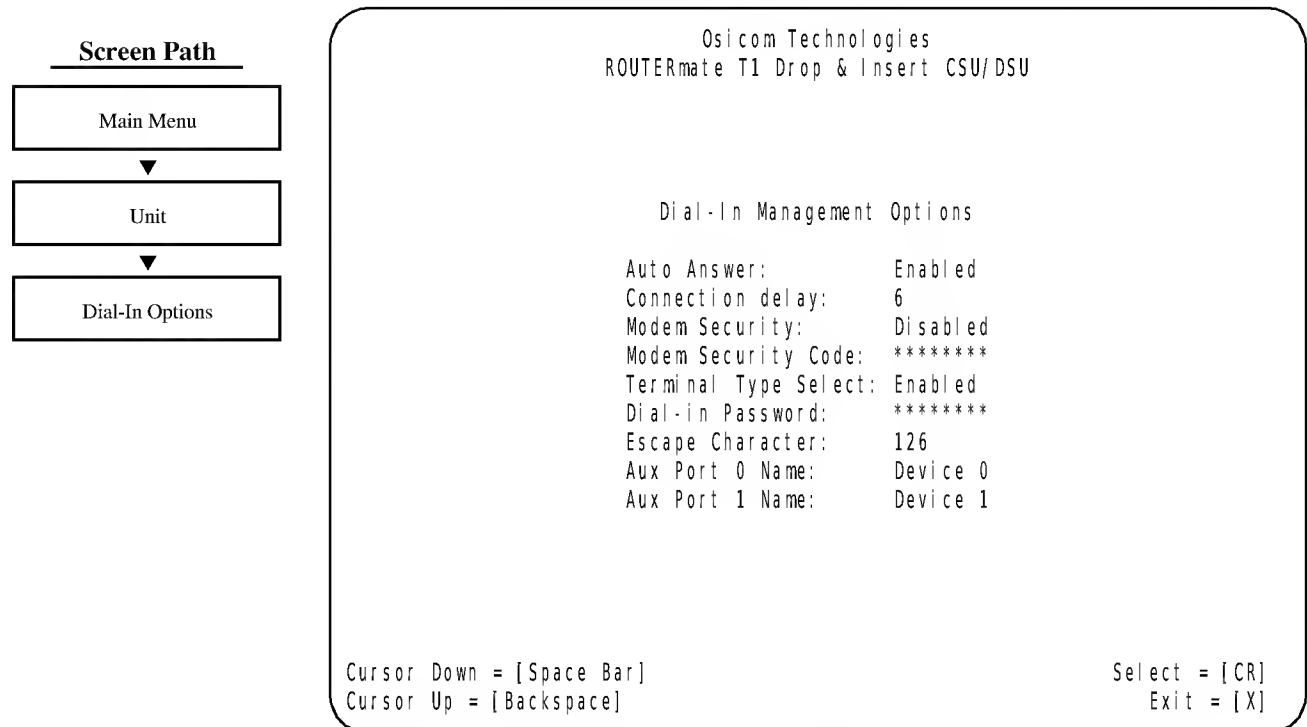


Figure 3-19. Dial-In Management Options

Modem Security

Determines whether the integral modem participates in a security check during the handshake sequence with an Osicom DCM4232 or DCM4532 modem.

For the security handshake to be implemented, the remote modem must be a DCM4232 or DCM4532.

If using Modem Security, the Modem Security Code must be the same as that of the answering modem.

Default: *Disabled*

Modem Security Code

This code is sent to a remote DCM4232 or DCM4532 modem during the handshake sequence.

To implement, the remote modem must be a DCM4232 or DCM4532, and **Modem Security** must be set to *Enabled* for the Routermate's integral modem.

Valid input: Up to eight numeric characters.

Default: the string *password* (matches the default for the DCM4232 or DCM4532 modem).

Terminal Type Select

Determines whether the Terminal Selection screen is displayed during a dial-in management call. Applies only if **Dial-in Password** is configured.

Default: *Enabled*

Dial-in Password

The user is prompted to enter this password after selecting a terminal type during a dial-in management call.

Valid input: Up to eight alphanumeric characters, case sensitive.

Default: *[CR]*

Escape Character

Defines the escape character that is used as a *hot key* for switching between multiple devices managed during a dial-in management call.

When only the configured escape character is typed, the user is returned to the Device Selection Menu.

When the character is typed and then followed within 1.5 seconds by a number 0-2, the result is as follows:

- 0 - switch to Device 0 connected to the **CONSOLE** interface (usually a router)
- 1 - switch to Device 1 connected to the **CONSOLE** interface (always an optional FPX4802/DES Frame Relay Encryptor)
- 2 - switch to the Routermate management screens

Wait 200 milliseconds after entering other data before using a hot key. Type a number 0-2, or L, within 1.5 seconds of typing the escape character or you go to the Device Selection Menu.

When a hot key is used to return to a device, it returns to the same screen it originally left.

Valid input: 0-255 (decimal representation for ASCII characters).

Default: 126 (decimal representation for the ASCII tilde (~) character).

Aux Port 0 Name

Aux Port 1 Name

The Aux Port Names are mnemonics to assist the user in determining what device is attached to which port. The string appears in the Device Selection Menu after **0 - AUX Port 0:** and **1 - AUX Port 1:**.

Valid input: Up to 30 alphanumeric characters.

Defaults: *Device 0; Device 1*

3.14.4 Alarm Call Options

NOTE

This screen is accessible only when a modem is installed.

The Alarm Call Options screen (Figure 3-20) provides the parameters to allow the user to enable, and to limit the use of the modem to send alarm notifications to an ASCII device attached to a remote modem.

The output of each call is in the format below:

```
FROM: <Unit ID Text> AT: <Unit's phone number>
dd.hh:mm:ss.cc <Alarm description text>
dd.hh:mm:ss.cc <Alarm description text>
...
dd.hh:mm:ss.cc <Alarm description text>
END
```

There is a newline sequence (carriage return, line feed) before the first line, and after all of the lines.

The dd.hh:mm:ss.cc is the SNMP systemUpTime at the time the alarm notification was started. The actual alarm condition may have been present earlier, due to configured trapDelay and Inter-Call Interval settings.

dd = days, hh = hours, mm = minutes, and cc = 100ths of a second.

When the unit first powers on and its T1 interfaces are not connected to anything, two red alarm notifications are generated. Both are sent in the first call, and look something like:

```
FROM: My ROUTERmate AT: 3013172222
00.00:00:10.51 NI - RED ALARM
00.00:00:10.71 NCTE - RED ALARM
END
```

Alarm Call Operation

Determines whether the Alarm Call feature is used.

Enabled - unit will attempt to dial out if the CSU detects a change in the NI or NCTE Red, Blue, or Yellow alarm conditions.

Disabled - Alarm Call feature is disabled; no calls will be attempted.

Default: *Disabled*

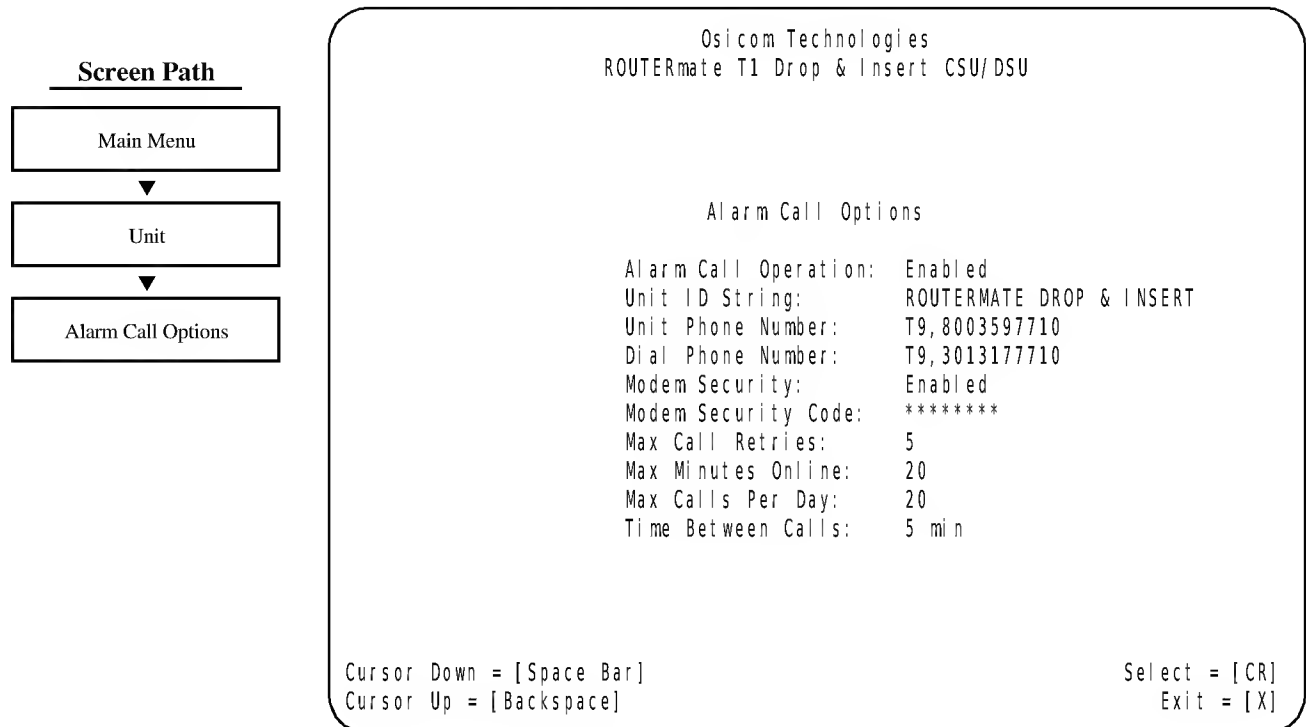


Figure 3-20. Alarm Call Options

Unit ID String

Identification text that is sent to the logging device along with the alarm description text. It is intended to describe the unit that is sending the alarm

Valid input: 30 characters

Default: *Blank*

Unit Phone Number

The telephone number of the modem integral to the CSU. This is printed out in the alarm notification to make it easier for support personnel to identify the calling unit.

Valid input: 20 characters

Default: *Blank*

Dial Phone Number

The number to be dialed when the alarm call is made. Special characters can be used in the number to control dialing, as follows:

- | | | |
|---|---|---------------------|
| P | - | pulse dial |
| T | - | tone dial (default) |
| , | - | delay 2 seconds |
| W | - | wait for dial tone |

Valid input: 20 characters

Default: *Blank*

Modem Security

Determines whether the integral modem participates in a security check during the handshake sequence with an Osicom DCM4232 or DCM4532 modem.

For the security handshake to be implemented, the remote modem must be a DCM4232 or DCM4532.

This feature deters unauthorized entry since the security check takes place before the call is connected. The handshake sequence uses an encrypted password scheme to control access to the dial-in screens.

If using Modem Security, the Modem Security Code must be the same as that of the answering modem.

Default: *Disabled*

Modem Security Code

This code is sent to a remote DCM4232 or DCM4532 modem during the handshake sequence.

To implement, the remote modem must be a DCM4232 or DCM4532, and **Modem Security** must be set to *Enabled* for the Routermate's integral modem.

Valid input: Up to eight numeric characters.

Default: the string *password* (matches the default for the DCM4232 or DCM4532 modem).

Max Call Retries

The number of times to retry a failed call before giving up.

Valid input: 0 to 10

Default: 5

Max Minutes Online

Maximum number of total minutes the alarm call can be online per day. This limits billing in situations where many calls are being made.

Valid input: 0 to 1440

Default: 20

Max Calls Per Day

Maximum number of calls that can be made per day. This feature provides a way to prevent the CSU from making an excessive number of calls.

Valid input: 0 to 999

Default: 20

Time Between Calls

Allows a time window to permit dial-in access between alarm notification calls. Also a way to prevent an excessive number of calls from being made in a short time.

Valid input: 30 seconds to 1 hour

Default: 5 min

3.15 Management

At the Management screen (Figure 3-21), configure the Routermate for SNMP and Telnet operation.

If you make changes, you are prompted to confirm the changes when you exit the screen. To save the changes, press **[Y]**.

Default settings are shown in Figure 3-21, and in brackets [] in the text.

Select Trap Client Table to display the SNMP Trap Client Table

Internet Address

This is the IP (Internet Protocol) address that is assigned to the Routermate. Position the cursor on the field and press **[CR]**. Enter the address in dotted decimal notation and press **[CR]** again.

NOTE

You must assign an IP address to the Routermate's SLIP interface to allow SNMP or Telnet management.

IP Subnet Mask

An IP subnet mask is not required for the Routermate to operate. It is suggested, however, you enter the same subnet mask as the router or terminal server to which the Routermate is attached.

SLIP Max Trans Unit

This defines the MTU (Maximum Transmission Unit) for the SNMP LINK interface. This length does not include the IP header, which is usually 20 bytes. The options are:

[296], 576, 1492, and 1500

Frames longer than the maximum packet size will be fragmented before transmission.

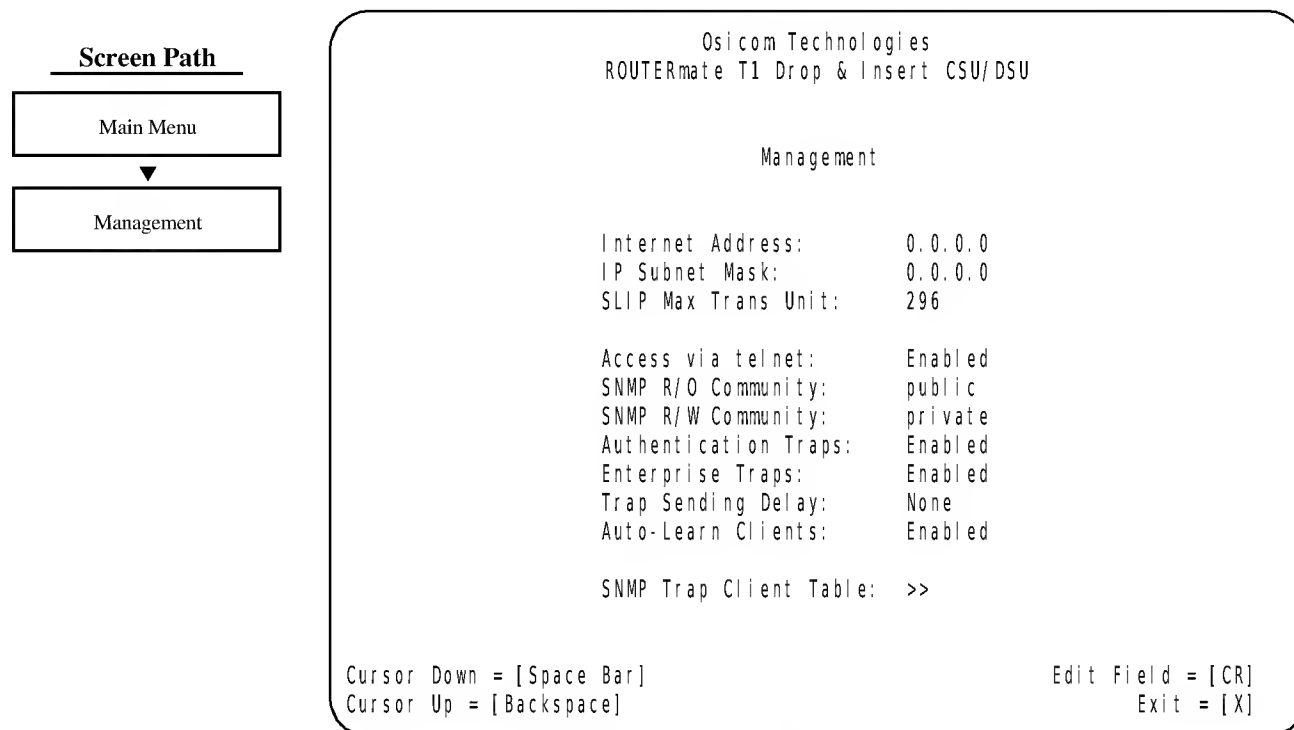


Figure 3-21. Management Screen

Access via telnet

This option provides a security feature; enable/disable telnet access of management screens. is prevented.

[Enabled] - telnet access is permitted.

Disabled - telnet access is prevented.

SNMP R/O Community

This is the community string used for read-only access to the RouterMate's MIB objects. Position the cursor on the field and press **[CR]**; type the string and press **[CR]** again.

SNMP R/W Community

This is the community string used for read-write access to the RouterMate's MIB objects. If this is set to the same value as the read-only string, write access is prevented. Position the cursor on the field and press **[CR]**; type the string and press **[CR]** again.

SNMP community strings are not included in the enterprise MIB; this is to prevent a user with read-only privileges from viewing the community strings.

Authentication Traps

[Enabled] - the RouterMate sends authentication traps when an SNMP request is received with an invalid community string.

Disabled - the RouterMate does not send authentication traps when an SNMP request is received with an invalid community string.

Enterprise Traps

An enterprise trap, or alarm (ie.: NI Red Alarm) is unsolicited information from an agent to the management station. Traps are the only type of unsolicited data that is permitted with SNMP. They occur only when a threshold within the agent is violated or when a major event occurs.

[Enabled] - enterprise specific traps are sent to the management station.

Disabled - enterprise specific traps are not sent to the management station.

Trap Sending Delay

This option permits the user to delay the generation of enterprise traps. During the delay interval, if the trap condition clears, no trap is sent. This provides a means of reducing the number of traps emitted for transient conditions.

[None] - all traps will be sent immediately.

Traps can be delayed by 10s, 30s, 1min, 2min, 3min, and 4minutes.

NOTE

The duration of the alarm condition is cumulative; therefore, multiple short alarms will generate a trap. For example, if the **Trap Sending Delay** is set for 1min, and the duration of multiple alarm conditions exceeds 1 minute, a trap is generated.

Auto-Learn Clients

For SNMP, determines whether the RouterMate automatically learns the IP addresses of SNMP management stations (clients) to whom SNMP traps are to be sent.

[Enabled] - the RouterMate learns the IP addresses of SNMP management stations from incoming messages and stores the addresses in the RouterMate's client address table. When events occur, traps are sent to each address in the client address table.

The IP addresses of up to 15 SNMP management stations can be learned automatically. The RouterMate learns, on an ongoing basis, the IP addresses of the 15 most recent management stations to access the RouterMate.

Disabled - the RouterMate does not learn the IP addresses of SNMP management stations. Traps are sent only to the IP addresses of any SNMP Trap Clients that are manually entered.

3.16 SNMP Trap Client Table

Select SNMP Trap Client Table at the Management screen to display the SNMP Trap Client Table (Figure 3-22).

If you make changes, you are prompted to confirm the changes when you exit the screen. To save the changes, press **[Y]**.

A trap, which is the SNMP term for an alarm or event, is unsolicited information from an SNMP agent to an SNMP management station. Traps are the only type of unsolicited data that is permitted with SNMP. A trap occurs only when a threshold within the agent is violated or when a major event occurs.

A trap client is an SNMP management station to which SNMP traps are routed. A trap client is identified by configuring an IP address for each of up to 15 SNMP management stations.

The Routermate reports both standard traps and enterprise traps.

The following standard traps are reported:

Link Up (specifies the NI or NCTE interface)
Link Down (specifies the NI or NCTE interface)
Warm start
Cold start
Authentication

Tables 3-2 and 3-3 (page 3-38) list the enterprise-specific traps provided in the Routermate T-1 Drop and Insert MIB.

Screen Path

Main Menu

▼

Management

▼

SNMP Trap Client Table

Osicom Technologies

ROUTERmate T1 Drop & Insert CSU/DSU

SNMP Trap Client Table

	Client Address	Type		Client Address	Type
1.	36.0.0.2	Static	9.	0.0.0.0	.....
2.	125.160.160.160	Dynamic	10.	0.0.0.0	.....
3.	0.0.0.0	.....	11.	0.0.0.0	.....
4.	0.0.0.0	.....	12.	0.0.0.0	.....
5.	0.0.0.0	.....	13.	0.0.0.0	.....
6.	0.0.0.0	.....	14.	0.0.0.0	.....
7.	0.0.0.0	.....	15.	0.0.0.0	.....
8.	0.0.0.0	.....			

Confirm this configuration?
 No Yes

Cursor Down = [Space Bar]
Cursor Up = [Backspace]

Select = [CR]
Exit = [X]

Figure 3-22. SNMP Trap Client Table

Table 3-2. NI Enterprise Traps

TRAP	DESCRIPTION
NI BlueTXOn	NI blue transmit alarm on
NI BlueTXOff	NI blue transmit alarm off
NI BlueRXOn	NI blue receive alarm on
NI BlueRXOff	NI blue receive alarm off
NI YelTXOn	NI yellow transmit alarm on
NI YelTXOff	NI yellow transmit alarm off
NI YelRXOn	NI yellow receive alarm on
NI YelRXOff	NI yellow receive alarm off
NI RedRXOff	NI red receive alarm off
NI RedRXOn	NI red receive alarm on

Table 3-3. NCTE Enterprise Traps

TRAP	DESCRIPTION
NCTE BlueTXOn	NCTE blue transmit alarm on
NCTE BlueTXOff	NCTE blue transmit alarm off
NCTE BlueRXOn	NCTE blue receive alarm on
NCTE BlueRXOff	NCTE blue receive alarm off
NCTE YelTXOn	NCTE yellow transmit alarm on
NCTE YelTXOff	NCTE yellow transmit alarm off
NCTE YelRXOn	NCTE yellow receive alarm on
NCTE YelRXOff	NCTE yellow receive alarm off
NCTE RedRXOff	NCTE red receive alarm off
NCTE RedRXOn	NCTE red receive alarm on

Client Address

This is the IP address for the SNMP management station to which SNMP traps are to be sent.

IP addresses are 32-bit numbers that are configured in 4-position, dotted decimal notation. To configure an address, move the cursor to an address field in the Client Address column and press [CR]. Type the address using decimal numbers and separating each address segment with a decimal point. Press [CR] to exit the field.

Type

This display field identifies a trap client as one of the following:

Dynamic - the IP address for this trap client was learned automatically from an incoming SNMP message.

Static - the IP address for this trap client was configured manually.

----- no address is assigned.

IP addresses for trap clients can be configured manually, or automatically learned.

For automatic address learning, see [Autolearn Clients](#) on page 3-36. Any addresses that are not entered manually can be learned automatically.

If it is desirable to limit the management stations to which traps are sent, the IP addresses for those management stations can be configured manually and the autolearn feature disabled. In this case, only those management stations whose IP addresses have been configured manually will receive traps from the Routermate.

4.1 Customer Support

Osicom Technologies offers a comprehensive range of customer support services, including technical assistance and maintenance agreements.

For technical assistance or detailed information about Osicom's Support plans or pricing, call 1-800-DLX-CARE (1-800-359-2273). Osicom can also be reached by e-mail at info@osicom.com and support@osicom.com.

4.2 Equipment Return and Repair

Corrective maintenance is limited to the testing and troubleshooting procedures provided in this manual. If, after contacting Customer Support, you are unable to correct any malfunction, please return the unit to Osicom Technologies for repair.

Prior to shipping the unit to Osicom Technologies for repair, call Product Repair at 301-317-7400 and request a Return Goods Authorization (RGA) number.

You may furnish information on defective units to Osicom Technologies by telephone. Please provide the following information:

- Unit part number and serial number
- Brief description of failure symptoms and cause
- Return shipping address (including sender's name)
- Preference of return shipping mode
- Invoice address
- Purchase Order number or letter of authorization for out of warranty units
- Person to contact for further information. Please include telephone number.

For the best equipment protection, use the original cartons and packaging material. Send the unit to:

Osicom Technologies, Inc.
9020 Junction Drive
Annapolis Junction, Maryland 20701

IMPORTANT

RGA number must appear on container!

Table A-1. Network Interface		
PIN	SIGNAL	DIRECTION
1	Receive	In
2	Receive	In
3	—	—
4	Transmit	Out
5	Transmit	Out
6	—	—
7	Ground	—
8	Ground	—



Table A-3. SLIP Interface		
PIN	SIGNAL	DIRECTION
1	—	—
2	—	—
3	RXD	In
4	GND	—
5	GND	—
6	TXD	Out
7	DTR	Out
8	RTS	Out



Table A-2. NCTE Interface		
PIN	SIGNAL	DIRECTION
1	Transmit	Out
2	Transmit	Out
3	—	—
4	Receive	In
5	Receive	In
6	—	—
7	Ground	—
8	Ground	—



Table A-4. Console Interface		
PIN	SIGNAL	DIRECTION*
2	Transmit Data	In (T, A0)
3	Receive Data	Out (T, A0)
4	RTS	In (A0)
5	Clear to Send	Out (T, A0)
6	Data Set Ready	Out (T, A0)
7	Signal Ground	— (T, A0, A1, C)
8	Carrier Detect	Out (T)
11	Detect Aux 0, Aux 1 Device	In (C)
14	Sec. Transmit Data	In (A1)
16	Sec. Receive Data	Out (A1)
20	DTR	In (A0)

* This signal is used for the device(s) noted, as follows:
T - serial terminal
A0 - Aux 0 device 0
A1 - Aux 1 device 1
C - detect cable for Aux 0, Aux 1 device



Table A-5. Modem Interface	
PIN	SIGNAL
1	—
2	—
3	—
4	Tip
5	Ring
6	—
7	—
8	—

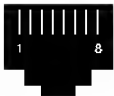
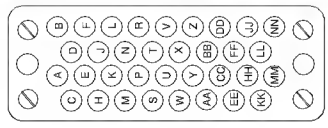
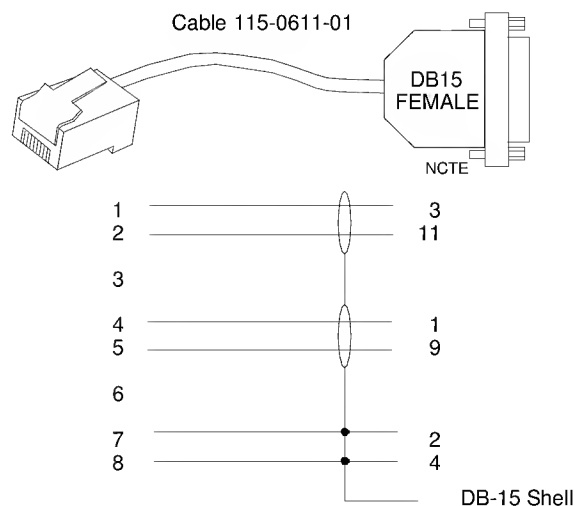


Table A-6 V.35 Interface		
PIN	SIGNAL	DIRECTION
E	Data Set Ready	Out
D	Clear to Send	Out
R	Receive Data (A)	Out
T	Receive Data (B)	Out
P	Transmit Data (A)	In
S	Transmit Data (B)	In
C	Request to Send	In
H	Data Terminal Ready	In
F	Data Carrier Detect	Out
B	Signal Ground	—
Y	Transmit Clock (A)	Out
AA	Transmit Clock (B)	Out
V	Receive Clock (A)	Out
X	Receive Clock (B)	Out
U	Ext Transmit Clock (A)	In
W	Ext Transmit Clock (B)	In

NOTE: Twisted pairs are shielded individually with shield terminations as shown.

Figure A-1. NCTE Interface Adapter Cable

NOTE

Cable ordering information is in Appendix B.

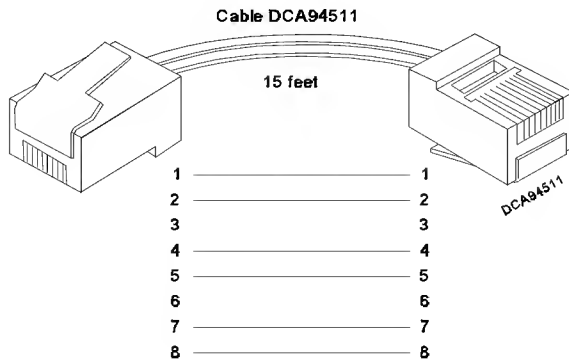


Figure A-2. NI Interface Cable

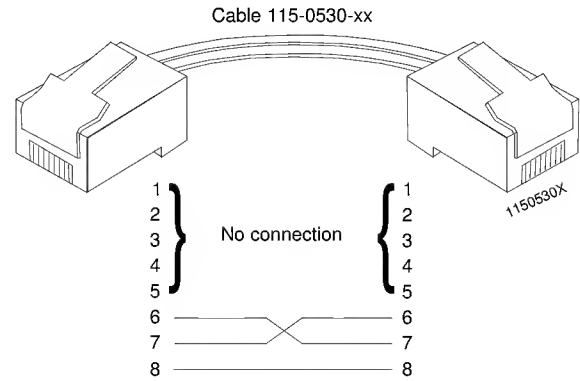


Figure A-4. DES Encryptor Management Cable

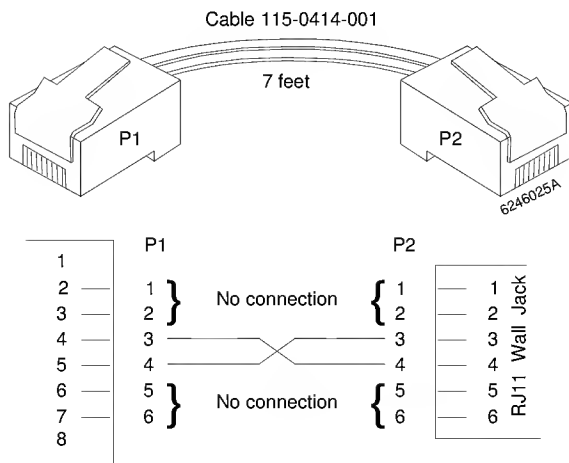


Figure A-3. Integral V.32 Modem Cable

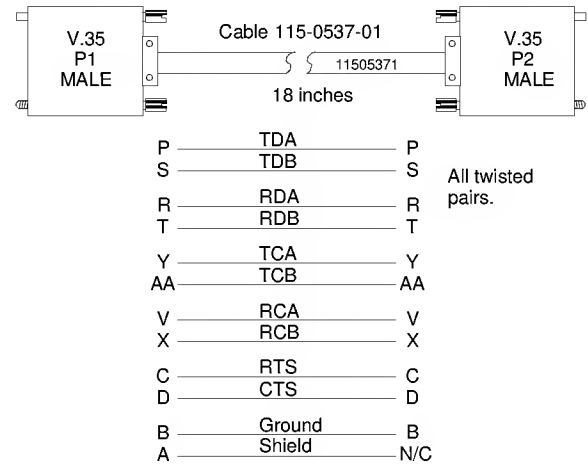
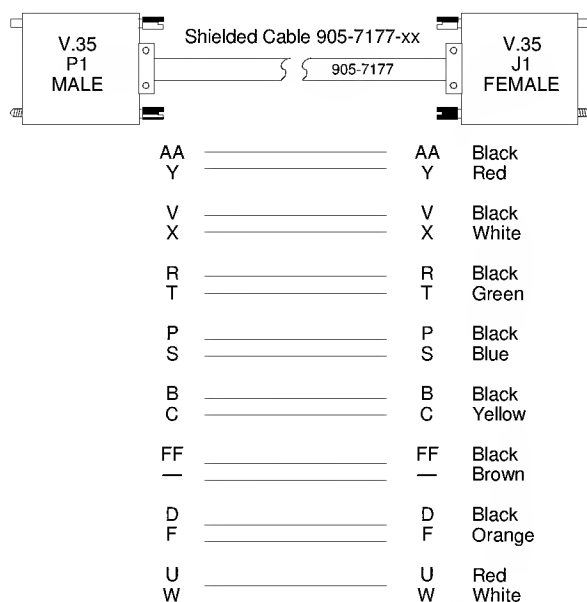


Figure A-5. V.35 Male-to-Male Cable

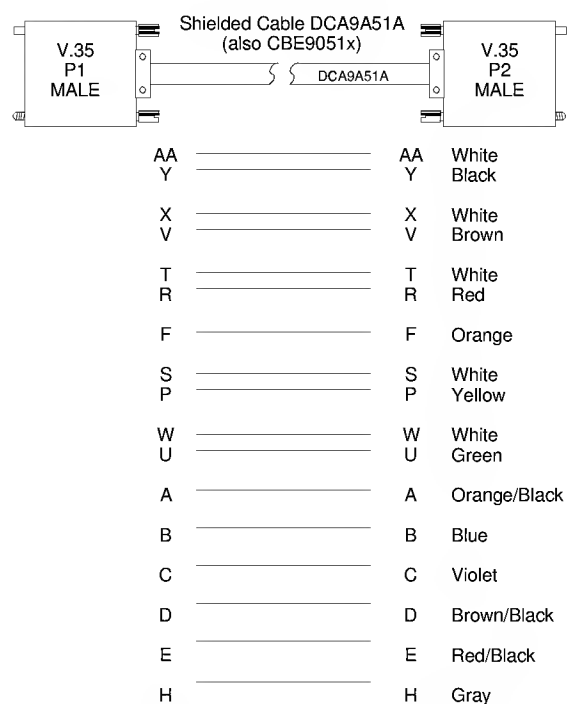
NOTE

Cable 115-0414-001 is a 6-pin cable that connects the 8-pin **MODEM** interface to a 6-pin RJ11 wall jack. Cable pins 3 and 4 align with **MODEM** interface pins 4 and 5, respectively.



NOTE: Wires are shown in twisted pairs.

Figure A-6. V.35 Male-to-Female Cable



NOTE: Wires are in twisted pairs, or single, as shown.

Figure A-7. V.35 Male-to-Male Cable

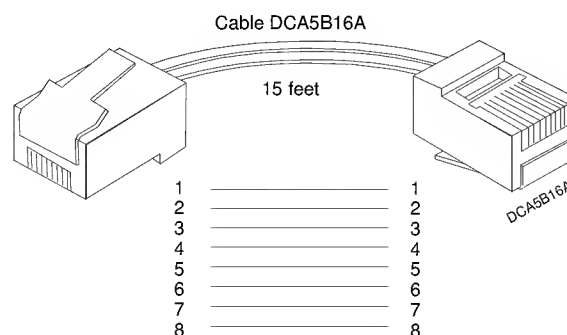


Figure A-8. SLIP Straight-through Cable

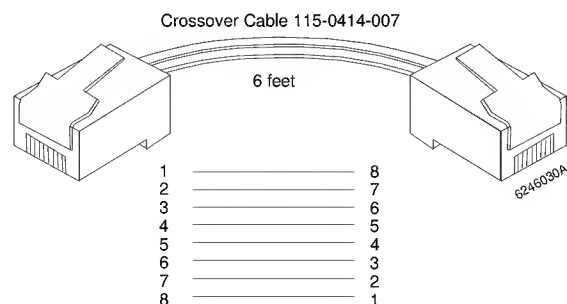


Figure A-9. SLIP/Dial-up Crossover Cable

Adapter 301-0018-01 is connected to the Routermate's **CONSOLE** interface for dial-in management of auxiliary devices. Cable DCA5B16A connects from a router, terminal server or other device to the **OUT 0** adapter connector. Cable 115-0530-xx connects from an FPX4802/DES Frame Relay Encryptor to the **OUT 1** adapter connector (see Section 2.7.2, page 2-12).

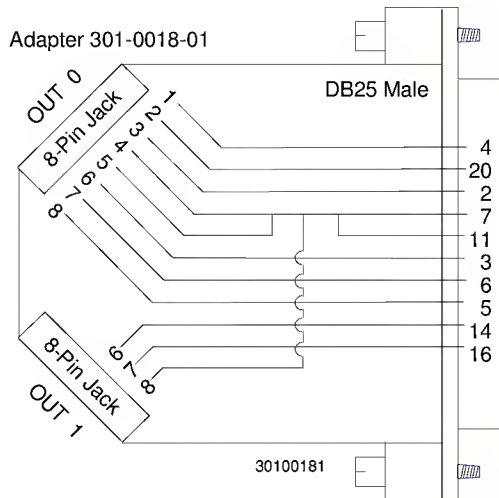


Figure A-10. Adapter, Dual 8-pin Jacks to DB25 Male

Adapter 115-0571-01 is used with cable 115-0414-007 for a SLIP connection to a router or other device with a SLIP interface configured as a modem (DCE), and also for a management connection to a router or other device with a management port configured as a modem (DCE).

Adapter 115-0572-01 is used in place of adapter 115-0571-01 if the SLIP or management connection is to an interface configured as DTE.

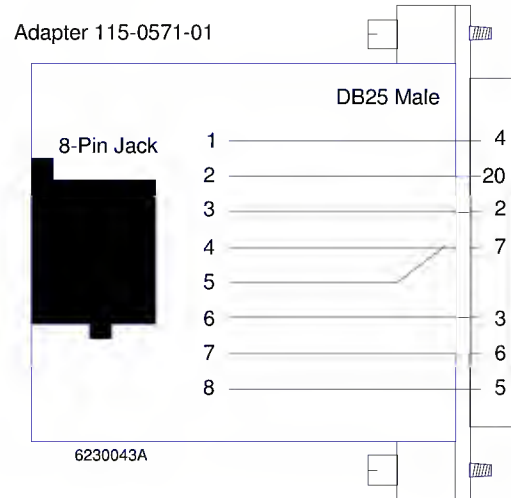


Figure A-11. SLIP/Management Adapter, DB25/Male

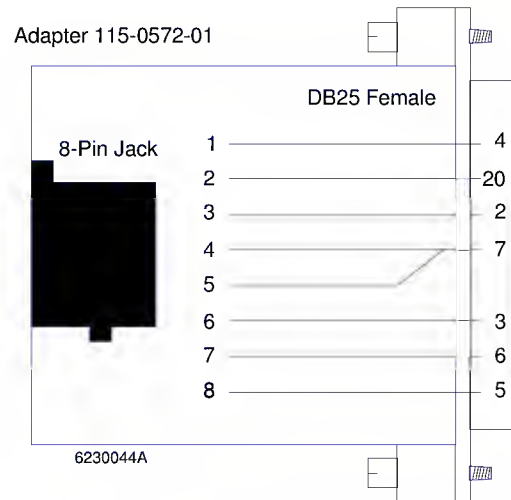


Figure A-12. SLIP/Management Adapter, DB25/Female

Table B-1. Routermate T-1 Drop and Insert CSU/DSU Ordering Information	
DESCRIPTION	ORDER NUMBER
Standalone Routermate T-1 Drop and Insert CSU/DSU, 115 VAC; includes: power transformer 550-0366-01 NI cable DCA94511 NCTE cable 115-0611-01	RMate-T1/DI
Standalone Routermate T-1 Drop and Insert CSU/DSU with integral V.32 Management Modem; includes power transformer 550-0366-02 NI cable DCA94511 NCTE cable 115-0611-01 DDD cable 115-0414-001	RMate-T1/DI/M
Rack-mount Routermate T-1 Drop and Insert CSU/DSU; includes: NI cable DCA94511 NCTE cable 115-0611-01	RMate-T1/DI/R
Rack-mount Routermate T-1 Drop and Insert CSU/DSU with integral V.32 Management Modem; includes: NI cable DCA94511 NCTE cable 115-0611-01 DDD cable 115-0414-001	RMate-T1/DI/M/R
Routermate 6-slot MiniRack, 115 VAC	RM-MiniRack/115
Routermate 6-slot MiniRack, -48 VDC, redundant with alarm contacts	RM-MiniRack/48V
MiniRack Transformer Rack Mount Kit	415-0043-01
MiniRack Transformer, 115 VAC, spare	905-7593-01
MiniRack Power Module, -48 VDC, spare	905-7287-03
Bitview Application Module, GUI management application using Castle Rock SNMP management software	BView/RM-T1/DI
Manual, Routermate T-1 Drop and Insert CSU/DSU Installation and Operation	918-6246
Power Transformer for Rmate-T1/DI (standalone without modem) for Rmate-T1/DI/M (standalone with modem)	550-0366-01 550-0366-02
Enterprise MIB	Free download from Osicom's Web site at www.osicom.com .

In Table B-2, the part number is the number that can be found on the cable or adapter. The order number is the number to use when placing an order.

Table B-2. Cable and Adapter Ordering Information		
DESCRIPTION	PART NUMBER	ORDER NUMBER
Network interface cable (8-pin modular, straight-through, shielded)	DCA94511	CBE9451 (15 ft)
NCTE interface cable (8-pin modular to DB15F)	115-0611-01	CBE06111 (6 in)
Integral modem to DDD cable (6-pin modular)	115-0414-001	CBE04141 (7 ft)
SLIP straight-through cable (8-pin modular)	DCA5B16A	CBE3802 (15 ft)
SLIP/Management crossover cable (8-pin modular)	115-0414-007	CBE04147 (6 feet)
DES Encryptor management cable (8-pin modular)	115-0530-01 115-0530-02 115-0530-03 115-0530-04	CBE05301 (6 ft) CBE05302 (12 ft) CBE05303 (25 ft) CBE05304 (50 ft)
V.35 cable (male-to-male, shielded)	115-0537-01	CBE05371 (18 in)
V.35 cable (male-to-female, shielded)	905-7177-01 905-7177-02 905-7177-03 905-7177-04 905-7177-05	CBE71771 (10 ft) CBE71772 (25 ft) CBE71773 (50 ft) CBE71774 (2 ft) CBE71775 (5 ft)
V.35 cable (male-to-male, shielded)	DCA9A51A CBE90511 CBE90512 CBE90513 CBE90514	CBE9051 (15 ft) CBE90511 (25 ft) CBE90512 (50 ft) CBE90513 (75 ft) CBE90514 (100 ft)
Adapter, dual 8-pin jacks to DB-25/M (for modem management of remote router and FPX4802/DES Encryptor)	301-0018-01	CBE00181
Adapter, single 8-pin jack to DB25M (for SLIP, dial-in management access).	115-0571-01	CBE73001
Adapter, single 8-pin jack to DB25F (for SLIP, dial-in management access).	115-0572-01	CBE73002
Note: Appendix A provides illustrations and pin specifications of these cables.		

Table C-1. Routermate T-1 Drop and Insert CSU/DSU Specifications	
ITEM	SPECIFICATION
Network Interface Termination Rate Format Coding Output Signal Input Signal Jitter Tolerance	RJ48C 8-pin modular jack 1.544 Mbps $\pm$ 50 bps Auto-detect, D4, or ESF Auto-detect, AMI (62411), AMI (No Density), or B8Zs DSX-1 w/LBO DSX-1 to -29 dB DSX Per AT&T Pub 62411
NCTE Drop and Insert Port Termination Rate Format Coding Output Signal	RJ48C 8-pin modular jack 1.544 Mbps $\pm$ 50 bps D4 or ESF AMI (62411), AMI (No Density), or B8Zs DSX-0 w/LBO
V.35 Synchronous Interface Termination Rate	Electrical: CCITT V.35; Mechanical: 34 pin female Any multiple of 56 or 64 kbps up to 1.536 Mbps
SLIP Port Termination Rate	Configured for SNMP and async Telnet RJ48C 8-pin modular jack 9600 bps
Console Termination Format	RS-232, 25-pin female 9600 bps, 8+N+1
Integral Management Modem (optional) Format Termination	Asynchronous, 9600 bps, V.32 analog dial-up 8-position modular, RJ-11
Timing	Internal, Repeater (NI), Repeater (NCTE), External to V.35
LDM Mode	Will drive up to 6000 feet
LED Indicators	ALM (Alarm), TST (Test), PWR (Power)
Power Standalone 6-slot MiniRack	120 VAC $\pm$ 10% , 57 to 63 Hz 120 VAC $\pm$ 10% , 57 to 63 Hz

Table C-1. Routermate T-1 Drop and Insert CSU/DSU Specifications	
ITEM	SPECIFICATION
Dimensions Standalone 6-slot MiniRack	9.6 inches deep x 6.25 inches wide x 1.6 inches high 10.5 inches deep x 17 inches high x 17 inches wide
Weight Standalone Rack-mount unit 6-slot MiniRack	2.3 pounds maximum 1.4 pounds maximum 7.7 pounds, empty
Temperature Operating Storage	32° to 104° F, 0° to 40° C –40° to 158° F, –40° to 70° C
Relative Humidity	0% to 95%, non-condensing

The multipurpose label for the Routermate is illustrated here for reference.

4800 SERIES ROUTER ^{mate} ™		
MAIN BOARD : SERIES HW/SW ___ / ___	FEATURE OPTIONS ☐ V.32bis ☐ ISDN U Compression : ☐ STD ☐ HI PERF Encryption : ☐ STD ☐ HI PERF ☐ PROP	SERIES HW ___ ___ ___
MEMORY OPTIONS : ☐ 4M <u>D</u> ram SIMM ☐ 2M <u>F</u> lash		
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions : (1) this device may not cause harmful interference, and (2) this device must accept any interference that may cause undesired operation.		
This device complies with Part 68 of the FCC regulations. T1 CSU/DSU Reg No. : 1R5USA-23055-DE-N 56K CSU/DSU Reg No. : 1R5USA-23056-DE-N 56K/64K CSU/DSU Reg No. : 5ITUSA-33075-DD-N T1 DROP & INSERT Reg No. : 1R5USA-31067-DE-N ROUTER plus T1 CSU Reg No. : 1R5USA-24168-DE-N ROUTER plus 56K CSU Reg No. : 1R5USA-24165-DE-N V.32 MODEM Reg No. : 1R5USA-24168-DE-N Ringer Equivalence :	For T1 CSU/DSU : This Class A digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations. Pour T1 CSU/DSU : Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur la matériel du Canada.	
POWER TRANSFORMERS ☐ P/N 550-0366-01 ☐ P/N 550-0366-02	BAR CODE LABEL	
LABEL	LABEL	LABEL
MANUFACTURED BY		
	9020 Junction Drive Annapolis Junction, MD 20701-1104, U.S.A.	
E-mail: info@osicom.com http://www.osicom.com 179-0493-01 REV		

Figure D-1. Multipurpose Label - Routermate

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